

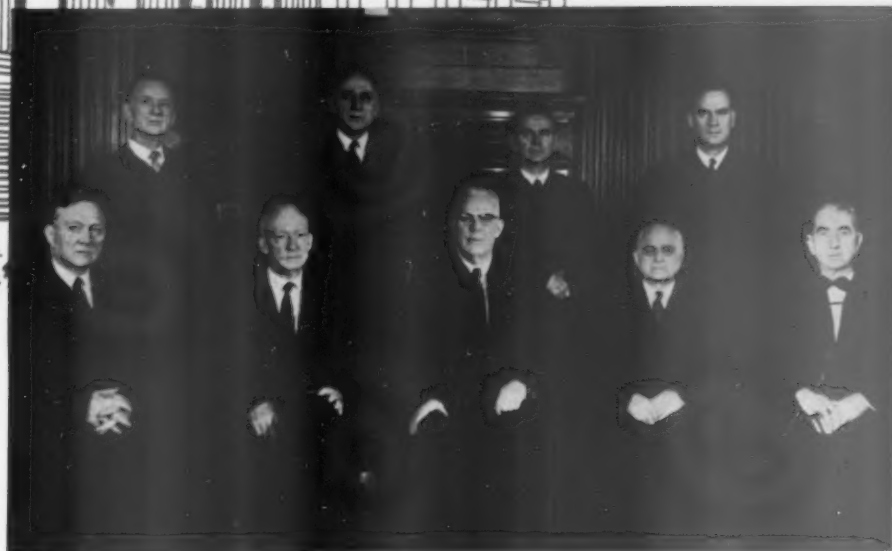
AUGUST 1960

ROCK

PRODUCTS



Climate
and design
spur cement
plant
construction
page 84



SUPREME COURT decides
against producers, page 91

ANOTHER WESTERN PRECIPITATION

THERM-O-FLEX

FOR VIRTUALLY 100% EFFICIENCY IN
CLEANING HOT KILN GASES!



Details on
this "Thermo-O-Flex"
Installation...

COMPANY

Portland Cement Company
of Utah

LOCATION

Salt Lake City—in "downtown"
area where high collection
efficiency is imperative.

INSTALLATION

A series of "Multiclone"
Collectors for preliminary
clean-up, followed by
"Therm-O-Flex" for final gas
cleaning—both Western
Precipitation products integrated
into ONE coordinated installation,
under ONE overall responsibility.

"THERM-O-FLEX" DATA

960 woven glass filter units
in 16 groups of 60 each.
Cleaning cycle—every half-
hour. Installation is 56' high,
30' wide, 81' long.

CLEANING EFFICIENCY

Virtually 100%
dust col-
lection!

Whether you are building a new cement plant or modernizing existing equipment, get the facts on Western Precipitation's amazing new "Thermo-O-Flex" filter-type gas-cleaning equipment—the equipment the cement industry is selecting **THREE-TO-ONE** over all other filter-type units combined!

Backed by over a half-century of experience, "Therm-O-Flex" units offer these important advantages...

SILICONE-TREATED GLASS FILTERS!

"Therm-O-Flex" does not use ordinary glass-bag filters—but **silicone-treated** woven glass filters that are much longer lived and easier to clean!

HEAT-RESISTANT TO 600°F.!

"Therm-O-Flex" filters clean hot kiln gases with ease. Inlet temperatures as high as 600°F. offer no problems!

CORROSION RESISTANT FILTER UNITS!

"Therm-O-Flex" filter units are of **glass**. They are unaffected by most corrosive gases and fumes!

CLEANED WITHOUT DESTRUCTIVE VIBRATION!

No destructive shaking or high-frequency vibration is necessary to clean "Therm-O-Flex" filter units. Instead, gentle **collapsing** action provides complete cleaning, thus prolonging filter life!

TROUBLE-FREE AUTOMATIC OPERATION!

Cleaning sequence is automatic—can be easily adjusted to a wide choice of time patterns to suit each requirement!

SEND FOR NEW "THERM-O-FLEX" BULLETIN

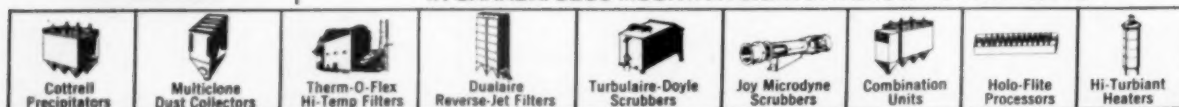
that gives detailed information on the most advanced and simplest method yet developed for cleaning gases from cement kilns, calciners, and other rock product operations! Our experienced cement plant engineers will gladly make recommendations to solve **your particular** gas cleaning problems!



WESTERN PRECIPITATION

DIVISION OF JOY MANUFACTURING COMPANY

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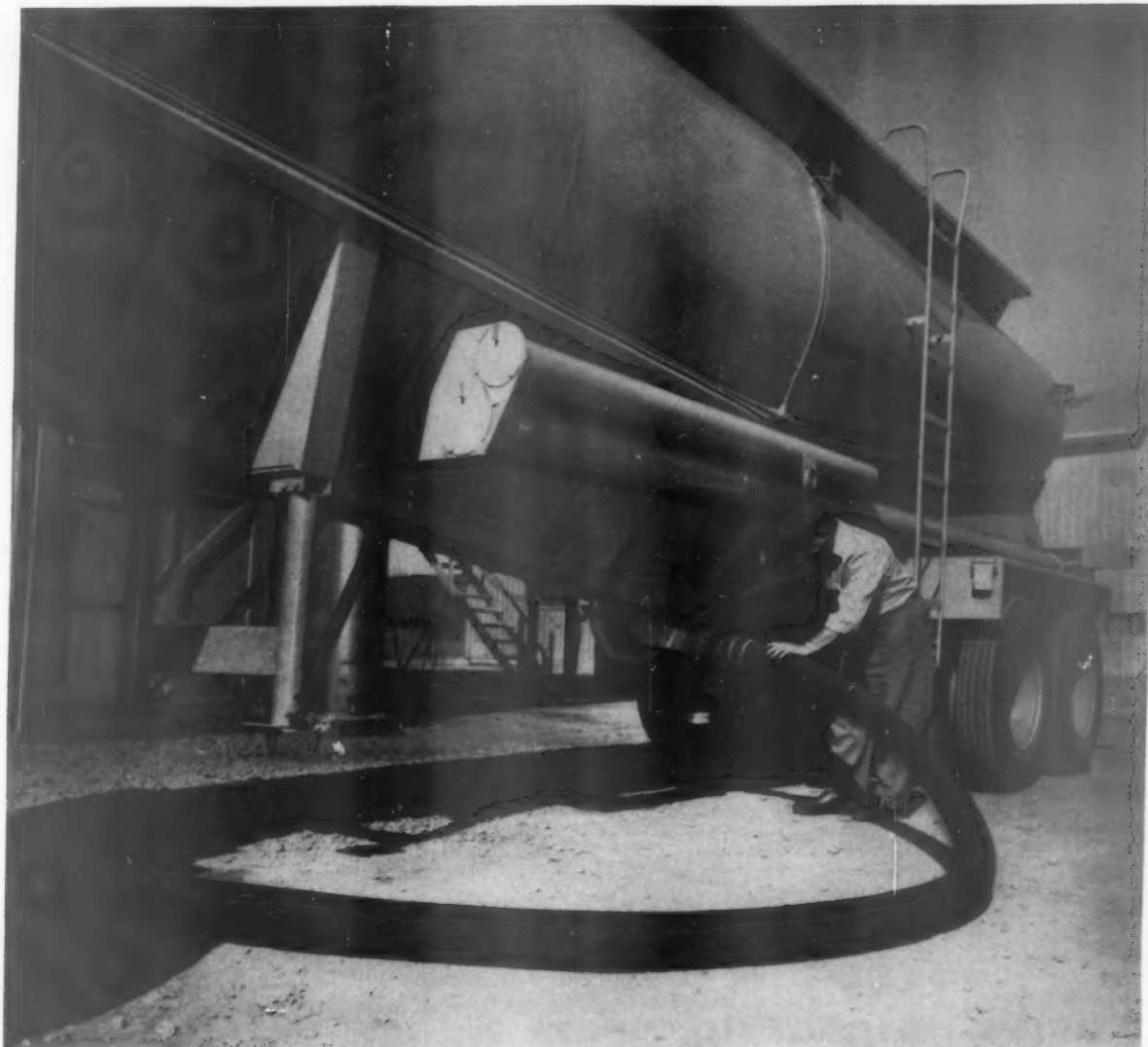


Photo courtesy Chemical Tank Lines, Inc., Downingtown, Penna.

Hose gulps dry cement, unloads truck in 30 minutes

Fast handling of bulk cement gets big assist from B.F. Goodrich hose

WHOOSHING through that hose at a 5-barrel-a-minute clip is dry cement on its way to storage hoppers. Unloading with hose instead of screw-type metal conveyors is faster and cleaner; hook-ups are easier to make. But the job couldn't be done with an ordinary hose. Friction of the abrasive particles would wear it out fast.

A big equipment manufacturer brought the problem to B.F. Goodrich. Specifications were worked out, and a hose with a special kind of lining was recommended. This lining is so tough

it has been used in some places to handle broken glass and granite chips.

Now, with B.F. Goodrich hose, bulk trailers operated by Chemical Tank Lines, Inc., Penna., can unload 113 barrels of cement in 30 minutes. The hose in the picture has been used 15 months, shows no sign of wearing out.

Because it's light and flexible, workmen find this BFG hose easy to handle, fast to connect. No need to jockey trucks back and forth to find just the right spot. The hose cover is built to take dragging over rough ground,

exposure to all kinds of weather.

For more information on this new cement-handling hose—or any of the many different products BFG makes for industry, write *B.F. Goodrich Industrial Products Co., Dept. M-896, Akron 18, Ohio.*



CEMENT-HANDLING HOSE

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ROCK

PRODUCTS

a Maclean-Hunter publication, Vol. 63, No. 8

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August 1960

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Look to Firestone to help keep big wheels turning—to keep the cycle going and the project moving smoothly toward your finish date! That's because Firestone off-the-highway tires have built-in toughness to take rugged abuse and reduce your downtime. Shock-Fortified nylon cord, for example, guards against impact damage. And Firestone Rubber-X, the longest-wearing rubber ever used in Firestone off-the-highway tires, provides a big payoff in extra service hours. Investigate Firestone's Giant Tire Service for tires and maintenance matched to every need of every project on your docket. Call your Firestone Dealer or Store. Or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Co., Akron, Ohio.

ALWAYS SPECIFY FIRESTONE TIRES WHEN ORDERING NEW EQUIPMENT

Firestone

BETTER RUBBER FROM START TO FINISH

ROCK PRODUCTS, August, 1960



Super Rock Grip
Wide Base*

Super Rock Grip
Deep Tread*

TUBELESS OR TUBED

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*Firestone T.M.

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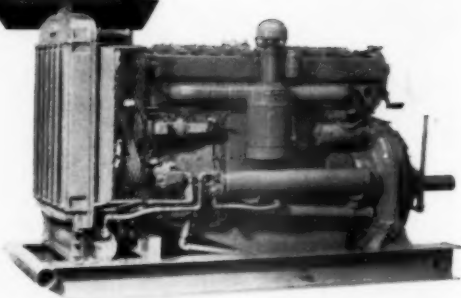
Two letters to remember in diesel engines and generator sets...

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THE

SERIES

MURPHY DIESELS



Here's the **MP** Series Line-up

MP SERIES ENGINES AND POWER UNITS
—105 HP to 320 HP, 1200 and 1400 RPM.

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MP SERIES GENERATOR SETS—80 KW to 156 KW.

MP SERIES MECH-ELEC UNITS for delivering mechanical or electrical power separately or simultaneously.

MP SERIES MARINE ENGINES AND AUXILIARIES—105 HP to 315 HP.



The 48-page booklet entitled "Before You Power a Job..." gives detailed information on MP Series Murphy Diesels. Ask your Murphy Diesel Dealer for a copy, or write direct. There's no obligation.

Deliver More Power Into the Job to Make More Profit for You

The power put into the job—not the power on the job, is the power that pays off for you. Engine reaction to load changes and speed changes determines the power that actually goes into the job. Only an engine with high rising torque can put more power into the job when needed.

MP Series Murphy Diesel engines are designed and built to deliver More Power into the job—the kind of *usable, hard-working* power you need. With high rising torque, they have the ability to take hold of a load and really hang on. This helps keep your equipment at the right operating speed for efficient production and More Profit. And remember, each day's production is determined by the *total power* put into the job that day.

To put MP Series Murphy power in your job, put Murphys on your job. You'll see the difference in your profits. Ask your Murphy Diesel Dealer for full information on the MP Series today.

**MURPHY
DIESEL**

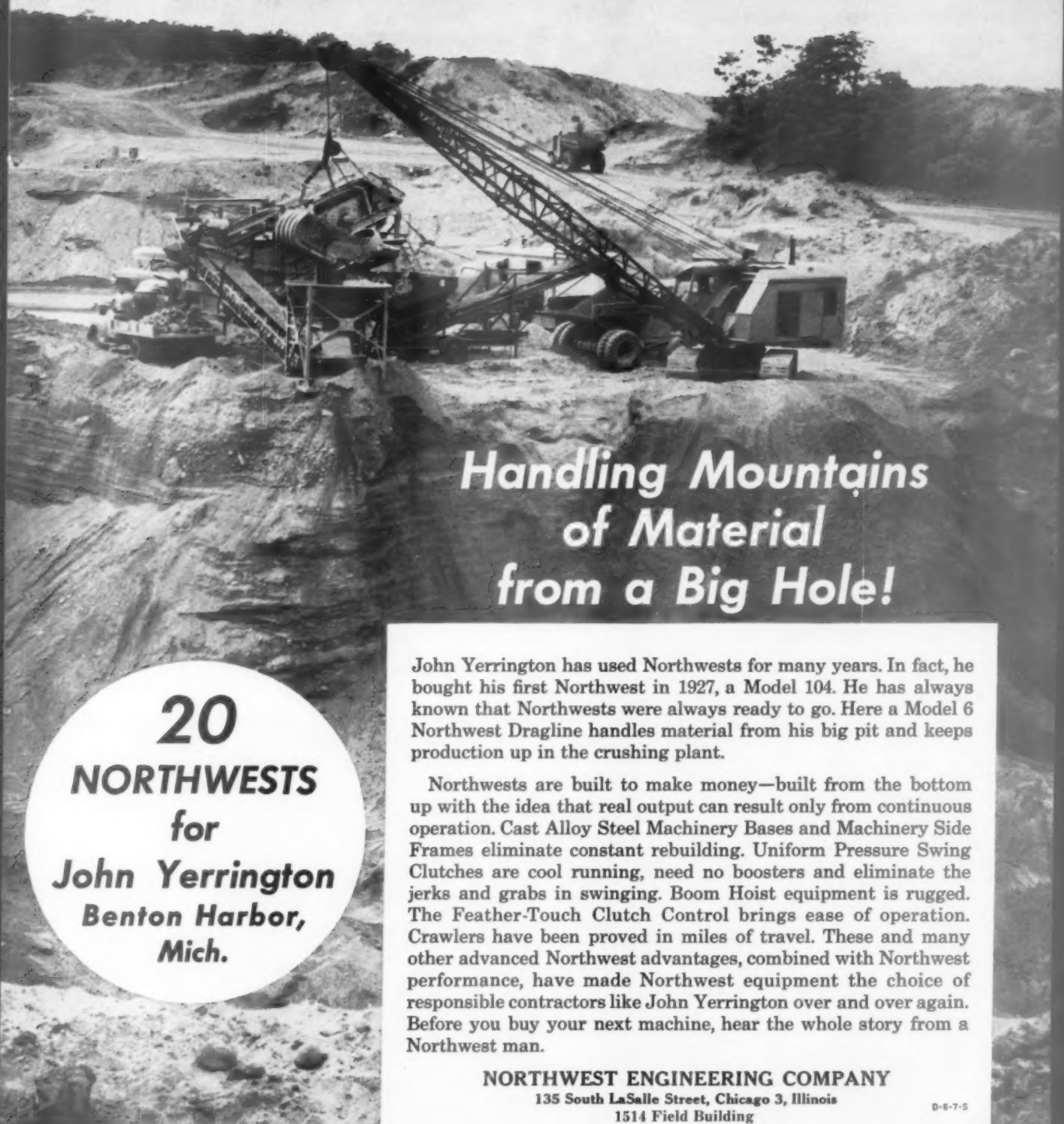
MURPHY DIESEL COMPANY
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Sales, service and parts throughout the nation

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ROCK PRODUCTS, August, 1960

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Handling Mountains of Material from a Big Hole!

20
NORTHWESTS
for
John Yerrington
Benton Harbor,
Mich.

John Yerrington has used Northwests for many years. In fact, he bought his first Northwest in 1927, a Model 104. He has always known that Northwests were always ready to go. Here a Model 6 Northwest Dragline handles material from his big pit and keeps production up in the crushing plant.

Northwests are built to make money—built from the bottom up with the idea that real output can result only from continuous operation. Cast Alloy Steel Machinery Bases and Machinery Side Frames eliminate constant rebuilding. Uniform Pressure Swing Clutches are cool running, need no boosters and eliminate the jerks and grabs in swinging. Boom Hoist equipment is rugged. The Feather-Touch Clutch Control brings ease of operation. Crawlers have been proved in miles of travel. These and many other advanced Northwest advantages, combined with Northwest performance, have made Northwest equipment the choice of responsible contractors like John Yerrington over and over again. Before you buy your next machine, hear the whole story from a Northwest man.

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This
PAYLOADER[®]
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THREE
MACHINES
AT
REEVES SAND & GRAVEL



Dozing about 1400 tons of raw gravel to the conveyor each day is a part-time job for the "PAYLOADER" — formerly a full-time job for a track-type bulldozer.



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*"The best
money-maker
we have
ever used,"*

says Melford Reeves

Reeves' operations consist of a large sand and gravel pit and a ready-mix plant. How a Model H-70 "PAYLOADER" has improved the efficiency of their pit is best told by the owner in his own words.

Melford Reeves says, "I selected the H-70 to load trucks from the stockpiles and the raw gravel scattered around the pit after a thorough test of two other machines. The H-70 was faster, had more power and better traction and its construction appealed to me. It was obviously built for heavy work and the strong lifting arms on a pivot below the operator's position would never cause an injury.

"Now after 6 months' experience, our entire operation centers around the 'PAYLOADER' which has proven the best money making machine we have ever used. We first retired the two power shovels that loaded the haul trucks—then almost by accident we discovered it could handle the dozing into the big conveyor hopper better than the tractor dozer did and still have time for its usual truck loading. On a typical day it may push 1400 tons of raw gravel into the conveyor—load out a fleet of trucks at the rate of 12 yd. load in 3½ minutes, plus chores like towing equipment and cleaning up the haul roads."

If you are not yet a "PAYLOADER" user the chances are that it will pay you to see your Hough Distributor. He has a size and model in the complete proven "PAYLOADER" line—from 2,000 to 12,000 lb. operating capacity—to fit your production needs. He also has the most complete service-parts facilities, backed by factory service personnel, to keep your "PAYLOADER" investment profitable.

HOUGH, PAYLOADER, PAYMOVER, PAYLOGGER and PAY are registered trademark names of The Frank G. Hough Co., Libertyville, Ill.



The H-70 has an operating capacity of 7,000 lbs. It is one of 10 proven "PAYLOADER" sizes—up to 12,000 lbs. capacity—available for any size job in the pit or around a plant.

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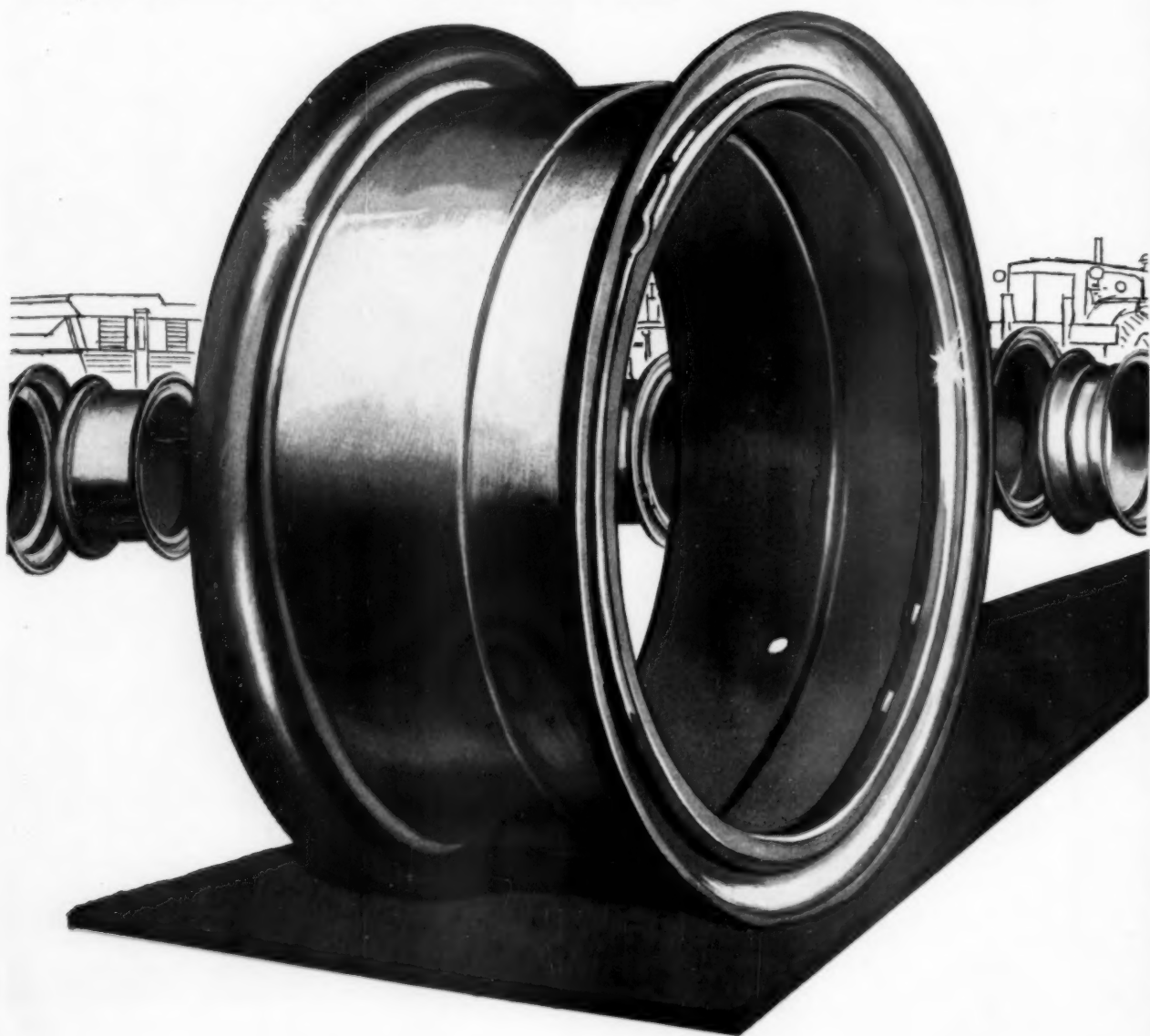
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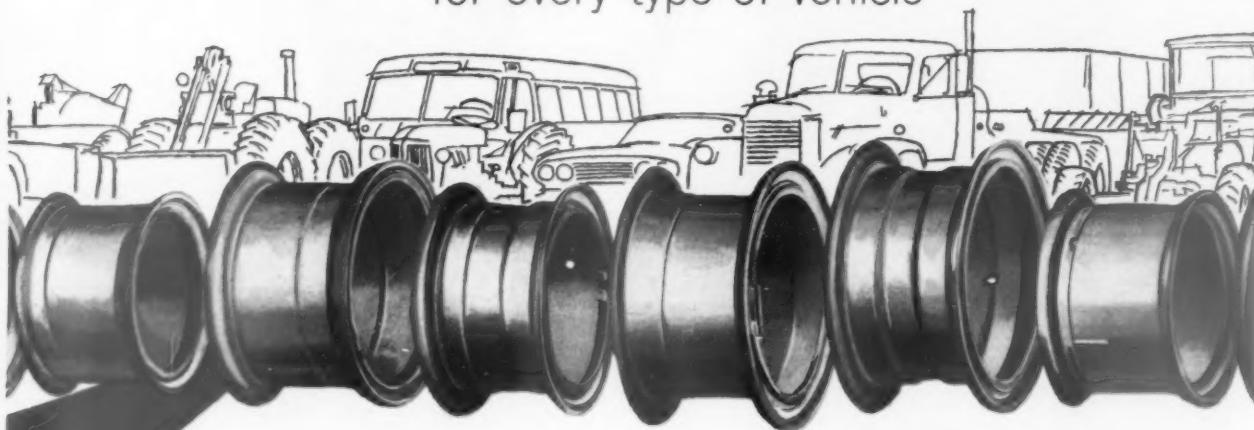


Lots of good things come from

GOOD

MILLIONTH RIM

Latest, greatest in the world's most complete line of rims, designed to provide superior performance for every type of vehicle



Some time this month, from Goodyear's huge modern facilities in Akron, will come the 60 millionth rim to be manufactured by the world's leading tire-maker.

Most likely it will be a Job-Master.

And this is appropriate, for the Job-Master is the culmination of Goodyear's long experience in building rims for every type of vehicle.

The Job-Master is the first rim designed to fit properly all flat-bead tires—the first designed to seal out all foreign matter. In fact, Job-Master represents the biggest advance in "over-the-road" rim design in over 15 years.

But Rim No. 60,000,000 could just as well be anything from a lightweight rim for pick-up trucks to a mammoth 45" size for giant earthmovers.

Whatever size and type this historic rim happens to be, of this you can be sure: it will embody every advantage

that Goodyear engineering skill can give it—and that's considerable. For example:

Longer rim life—because they're job-designed by experts.

Truer running performance—virtual elimination of "wobble" and "hop"—lateral and radial run-out.

Longer uninterrupted service—fewer road delays, more miles, lower cost-per-mile.

Bond-A-Coat Finish—a Goodyear exclusive, providing lasting protection against rust and corrosion.

Our industry leadership, experience and knowledge gained in building 60 million rims qualifies us to solve your rim problems. Write the Goodyear Rim Sales Engineer. Address: Goodyear, Metal Products Division, Akron 16, Ohio, or get in touch with your local Goodyear Rim Distributor.



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on Goodyear Rims
than on any other kind**

Job-Master—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

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WHAT'S HAPPENING

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

Can nuclear energy transform clays into useful aggregates? The question would be up for investigation in a \$34-million highway research program recommended by the Highway Research Board of National Academy of Sciences-National Research Council. Aggregates and soils headed the list of 19 high-priority subjects in their recommendation, upon which action was expected to be taken by American Association of State Highway Officials. More knowledge is urgently needed about aggregates and soils, says the committee, because of the accelerating demand for road building materials and the diminishing supply of top-quality aggregates.

Combining cornstarch with acid phosphate salts results in a compound with many uses. One is to bind taconite for the pelletizing process. International Minerals and Chemical Corp. has licensed American Maize-Products Co. to make the compound. Besides the use already mentioned, the starch phosphate will be put to work making frozen foods more appealing. Sauces and gravies retain a clear, natural look even when frozen when the new starch is substituted for the regular type, maintains Dr. James W. Evans, AM-P's vice president in charge of research and development. Sales to textiles, adhesives, drugs and cosmetics industries also are expected. When used as a taconite binder, "Our product would burn away, and not add to the slag problem," said Dr. Evans.

Paper-thin sheets are made from synthetic mica flakes in a method developed by Bureau of Mines scientists at Norris, Tenn. Strong, flexible and possessing high dielectric strength, the mica could be superior to imported high-grade natural mica for uses in electronics. In preliminary high-temperature tests, the synthetic-mica sheets retained their properties better than natural mica, but further work is being done to reduce their tendency to absorb water in storage and to improve their properties.

Welded wire fabric is being tested in asphalt paving to see whether it provides the answer to the chuckhole problem. Those studying the reinforced asphalt overlays under pounding of heavy traffic have taken a cue from concrete pavement construction, in which strong steel reinforcing mesh has been used for a long time.

Traveling salesmen are driving farther to sell rock products in 1960 than they did in 1959. This was discovered in a survey covering all industries by Wheels, Inc. Average mileage for rock and cement salesmen driving autos on company business rose to 2,013 miles per month for the first four months this year, compared to a monthly average of 2,024 miles for the same period of 1959. The 12-month average for the rock and cement industry last year was 23,800 miles.

Lime putty mortar is delivered to the job site by tank truck in Toronto. It has been developed and introduced on an experimental basis by Ontario Building Materials Ltd., whose president, John Wheeler, also heads Cobo Minerals Ltd. A meter on the tank truck, specially designed in cooperation with Neptune Meters Ltd., shows the amount of mortar pumped out, allowing the driver to give the customer a record of amount and price. Of creamy liquid consistency, the lime is ready for use, needing no slaking or cooling; it can be stored in drums until needed. To form plaster, it is mixed with gypsum; to form masonry mortar, it is mixed with cement and sand.

Clam shells neutralize acidic wastes at Du Pont's Sabine River Works, Orange, Texas. Inexpensive and handy, the shells are dredged locally and truck-delivered to a timber-lined pit twice a day. Up to 300 gpm. of the acidic waste liquid, with a pH of 1.5, is fed into the pit bottom. Rising upward through the bed of shells, it achieves a pH of 5.6 by the time it flows into a sump. The stream then needs very little sodium hydroxide treatment to meet the specified minimum disposal pH of 6. Du Pont engineers, reports Chemical Engineering, exceeded their expectations in amount of NaOH saved: 85 percent during the first four months of operation.

A new discovery provides a basis for study of space geology. Abundant and extensive samples of coesite, a mineral apparently formed by the collision of a meteorite with the earth millions of years ago, were found in Meteor Crater in Arizona. This is the first time that coesite, a dense and highly stable form of silica, has been discovered in its natural state. Requiring extremely high temperatures and pressures for its formation, it previously was created artificially in the laboratory. Dr. Edward C. T. Chao of the U. S. Geological Survey made the discovery. His colleague, Dr. William T. Pecora, said that examination of the samples will help scientists in their study of space geology—giving them a head start when and if samples of minerals are brought back from the moon or other planets.

A Danish product, "Luxovite," makes bituminous road surfacings lighter in color. It consists of burnt flint chips that result from heating black boulder flint to 1,832 deg. F. The blue-black color changes into almost pure white and its amorphous structure becomes crystalline. Generally, it has made up 40 percent of the surfacing material, but results are said to be good even with 25 or 12½ percent.

Chemicals will be derived from coal shale in a process ready for commercial development. A plant will be built by North American Coal Corp. near its Powhatan, Ohio, mine. Employing a process developed in a joint study program with Strategic Materials Corp., it will have a capacity of 40,000 tpy. of aluminum sulfate, to start. Initial production is scheduled for June 1961. Says Chemical and Engineering News, "Part of the production will be used to iron out some of the final stages of the process, which aims for aluminum oxide as the end product."

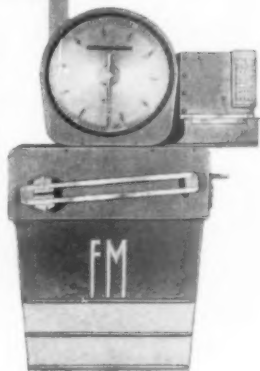
Road builders turned to sawdust in Canada—for a subbase material. The lumber industry by-product is being tested on the Trans-Canada Highway near Vancouver. In a section where boggy peat land extends 50 ft. deep in loose composition, they laid sawdust to a 7-ft. depth and topped it with 3½ ft. of gravel.

NOW... an accurate printed record of everything you weigh *Automatically!*

- Time, date and other identifying symbols may also be recorded simultaneously with weight.

- Weights are printed in digits 5/32" high.

- Also available: consecutive numbering devices, repeaters, coin operating mechanism, balance detector, roll tape and ticket printing, open throat design printer that permits weight tickets to be inserted from either front or side.



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THE VERSATILE ATTACHMENT that fits any F-M Floaxial Dial Scale to provide you with accurate permanent printed records. Completely eliminates the possibility of human errors in weighing operations; does away with costly disputes between buyer and seller, weighman and trucker. Instead, you get *truly automatic weighing*... the Floaxial Dial Scale plus Printomatic accurately record correct weights on tickets, roll tape or both!

WAREHOUSES find *Printomatic* valuable in effective cost control. *Printomatic* furnishes a printed, permanent record of every shipment entering the warehouse—an effective check on the cost of raw materials.

INDUSTRIAL OPERATIONS often include *Printomatic* directly on the assembly line to accurately weigh and tag products and product parts.

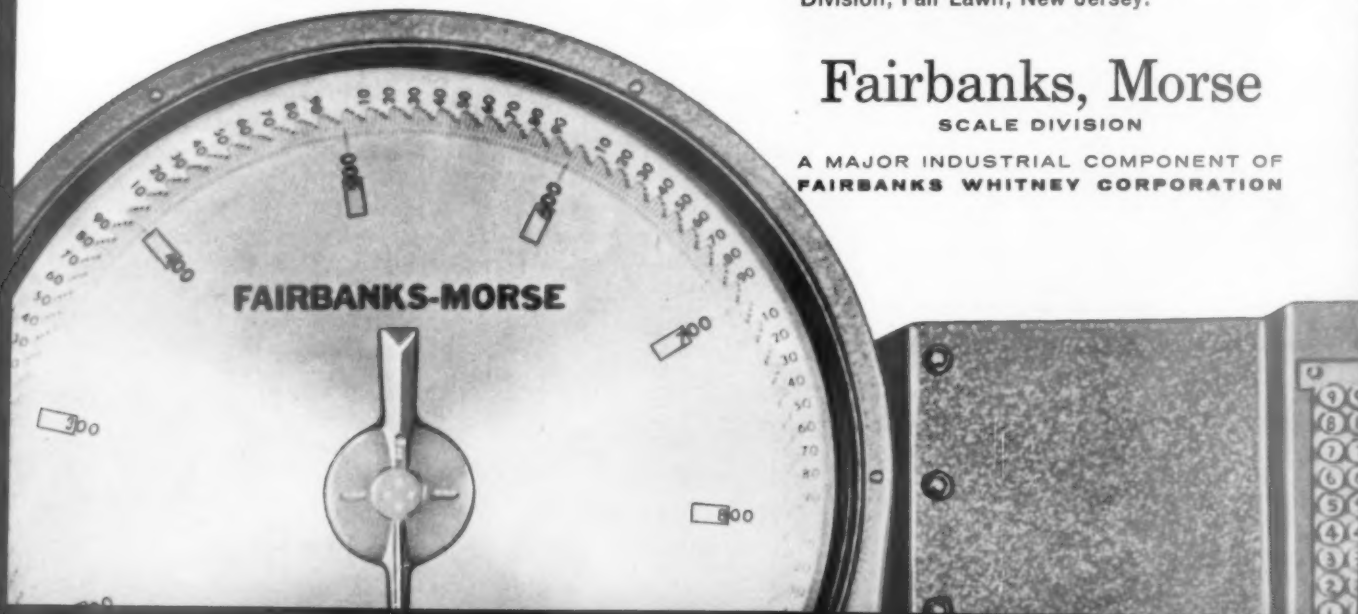
F-M *Printomatic* Weigher makes the printing of weight figures a simple matter—no matter what the application! Check these dependable Fairbanks-Morse *Printomatic* features.

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Fairbanks, Morse

SCALE DIVISION

A MAJOR INDUSTRIAL COMPONENT OF
FAIRBANKS WHITNEY CORPORATION



NOTES FROM THE PUBLISHER

August, 1960

Dear Reader:

There's nothing as valuable as an idea.

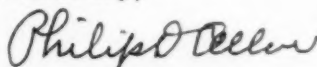
Whether you are a president of a large mill, whose main job is to show the stockholders a better yield on their investment, or a superintendent who is constantly under the gun to speed production and reduce costs, you are always on the lookout for ideas.

That's one of the reasons you're reading ROCK PRODUCTS. You are looking for information and ideas that will help you do a better job.

Our editors are doing an outstanding job in reporting end results of the use of equipment, processes and methods used in combination. Every month they lead you through plant operations, giving you a personalized, realistic record of what your fellow-producers are doing. They give you reports on technical and management questions. They tell you of the big things that are going on in your industry. And that is their job—to reflect the rock products industries.

But they are not prepared to give you details on specific value of each individual piece of equipment, nor the parts that go into it to make the whole. The manufacturers are the experts in this area. Their messages on advertising pages are chock full of basic information that will spark new ideas for you...and help you do a better job.

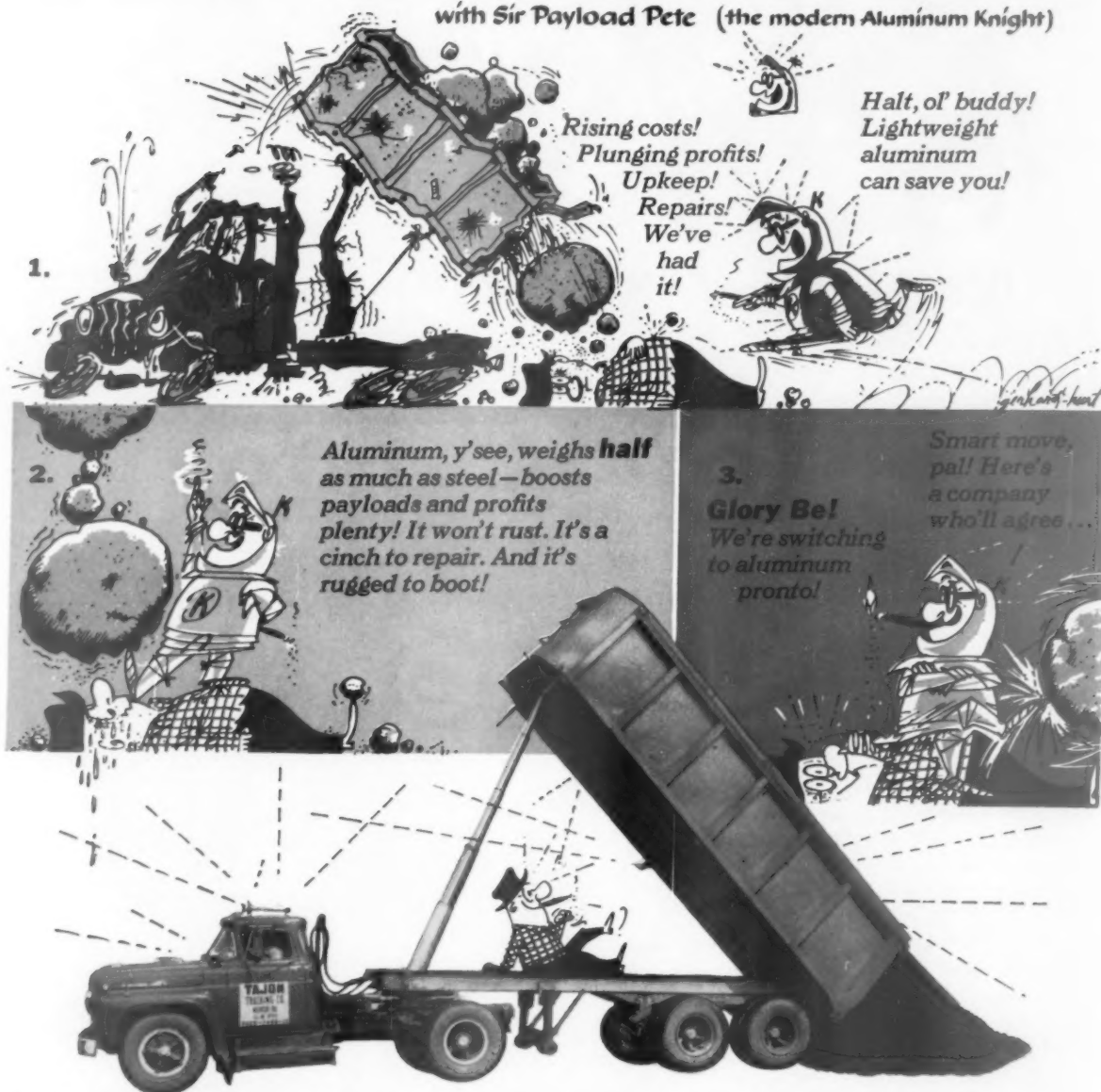
Sincerely,



Philip D. Allen
Publisher

THE DUMPER'S DILEMMA

with Sir Payload Pete (the modern Aluminum Knight)



\$7 TO \$10 PROFIT BONUS PER DAY WITH ALUMINUM The Tajon Trucking Co., coal haulers of Mercer, Penna., operates a fleet of modern all-aluminum dump trailers manufactured by the Penn Body Division of the Hockensmith Corp. Because both body and chassis are made of aluminum, each unit weighs in at only 8,300 lbs. as opposed to 10,500 lbs. for an equivalent steel unit. According to enthusiastic John Chutz, president, "We obtain \$7 to \$10 increased profit per day thanks to this 2,200-lb. payload bonus. The cost difference between aluminum and steel is paid for in one year, and from then on it's pure profit."



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TELSMITH

42"x48" JAW CRUSHER

with welded steel frame

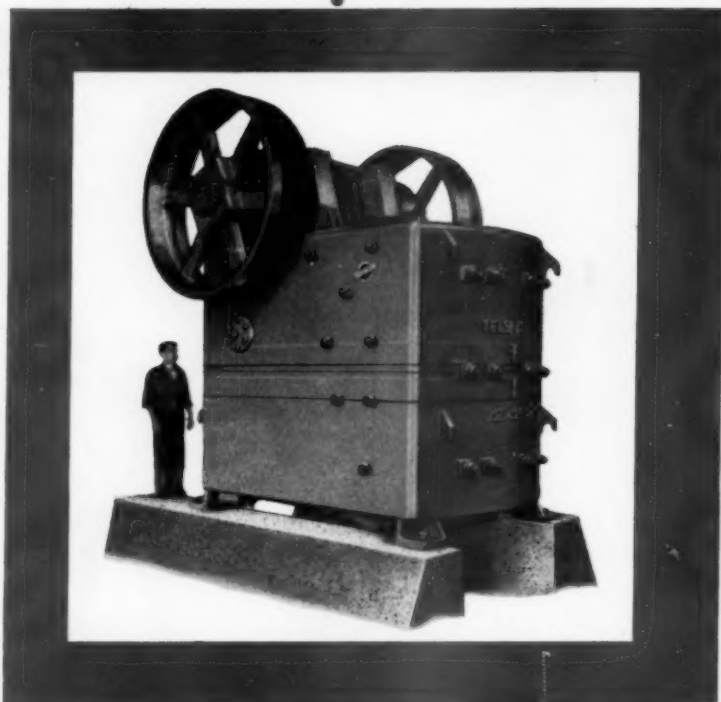
GREATER CAPACITY! Who says so?

Large aggregate producers who have owned and used other good makes of jaw crushers! That's *how they know* that this Telsmith 42 x 48 gives 'em more production, right along. It's Telsmith design—based on long years' experience—design that correctly locates pitman shaft and toggle in relation to crushing chamber; then combines this with the stroke and speed that's exactly right.

THE BEST FRAME EVER BUILT — a double-wall, box-section, continuous-welded, accurately machined, stress-relieved, two-piece, all-steel main frame.

ALL PROVEN FEATURES — Annealed cast steel pitman; large diameter eccentric shaft; cylindrical type heavy-duty roller bearings; reversible jaw dies; and hydraulic adjustment of discharge opening. For reliable, profitable production—you can't buy a better jaw crusher.

BULLETIN 280 gives complete specifications—send for it.



J-2



Producing aggregate for St. Lawrence Seaway with 42 x 48



Mounted 42 x 48 for road construction in Oregon



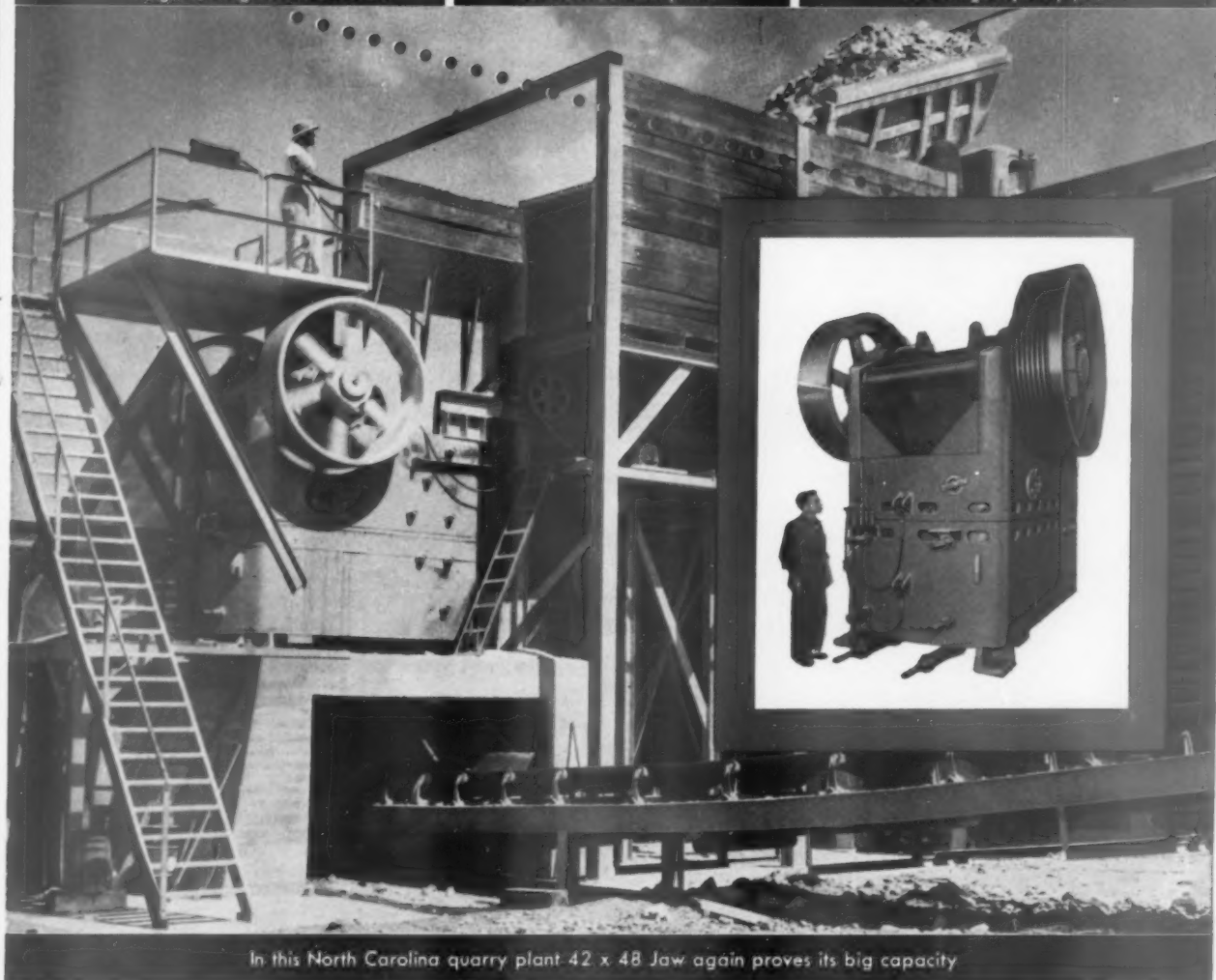
Alabama crushing plant gets large tonnage from 42 x 48



A 42 x 48 in large mid-western cement plant



42 x 48 is a "peach" for production in Georgia quarry plant



In this North Carolina quarry plant 42 x 48 Jaw again proves its big capacity

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ROCK PRODUCTS, August, 1960

by GEORGE C. LINDSAY

Government cracks down on depletion

MANY ROCK PRODUCTS PRODUCERS will have to realign their basis of economic thinking and planning. The U. S. Supreme Court and Congress made sure of it by recent actions.

Two events are of vital importance to industry producers. Late in June, the Supreme Court ruled against the taxpayer in the vital Cannelton Case. Following close on the heels of that decision, Congress spelled out new restrictions on figuring percentage depletion allowances in its Public Debt and Tax Rate Extension Act of 1960 (See special article, p. 91).

The Supreme Court decision upset many rulings handed down by lower courts previously, most of which were in favor of the taxpayer. Some important points in the Cannelton decision include:

- 1—"... Congress intended to grant miners a depletion allowance based on the constructive income from the raw mineral product if marketable in that form, and not on the value of the finished articles."
- 2—"For purposes of percentage depletion, a particular taxpayer's profit position is not relevant."
- 3—"Depletion is not a subsidy to manufacturers or the high-cost mine operator. "... the miner-manufacturer is but selling to himself the crude mineral that he mines, insofar as the depletion allowance is concerned."
- 4—"Depletion ... was designed not to recompense for costs of recovery but for exhaustion of mineral assets alone."

In its new law, Congress finally spelled out its intent toward percentage depletion after many years of confusion in the minds of courts, Treasury and taxpayers. Integrated mining-manufacturing concerns, like cement, were particularly involved.

The new law, effective for taxable years after Dec. 31, 1960, is more specific regarding treatment processes considered as mining. Three new amendments were added, one of which applies "in the case of calcium carbonates and other minerals when used in making cement." The cut-off point is set at the kiln feed. Another new paragraph deals with clay. No change was made in the paragraph on treatment processes excluded; "fine pulverization" is still listed.

Your future status can be best served by getting your legal counsel's interpretation of the Cannelton decision and the new law. Watch for Treasury's issuance of a new set of regulations. No word yet on when they'll be available.

**ZEROS IN ON ELECTRICAL SYSTEM RELIABILITY, SAFETY,
ZEROS IN LOW MAINTENANCE**

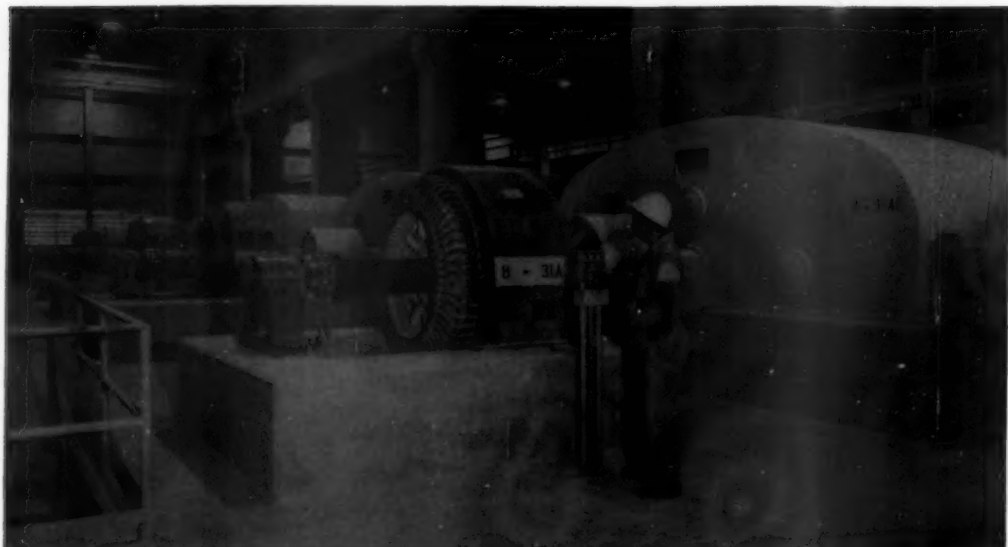
Westinghouse



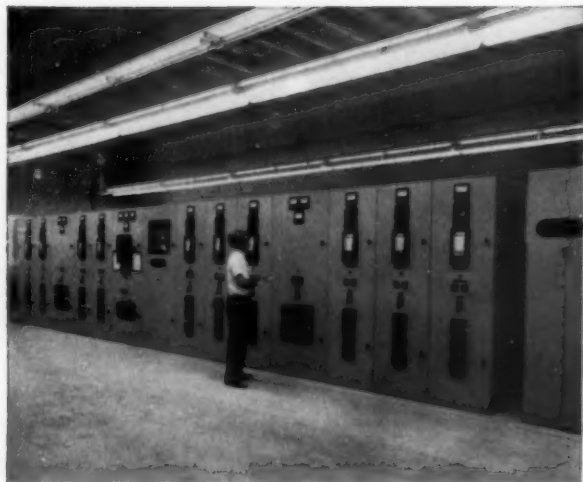
POWER FOR PRODUCTION at Lehigh Portland's new Miami plant is supplied by this main 15,000-kva double-ended substation located outdoors. It is double-ended for easier maintenance without a power outage, and located on the windward side for less flashover. This design gives greater flexibility and reliability. Some advantages are periodic insulator and bushing cleaning, no load tap changing, reduced capacity operation . . . all without a power outage. Like most electrical equipment in the plant, substation has provision for extra capacity, will accommodate 18,750 kva.



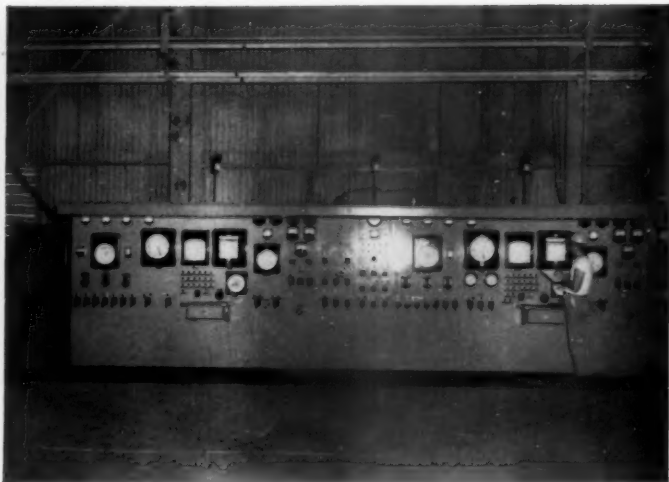
HERE'S HOW LEHIGH PORTLAND HIT



SYNCHRONOUS, COUPLED-TYPE MOTORS driving the Lehigh plant ball mill help assure top production. Thermalastic® insulation, with neoprene coating, offers a dimensionally stable, resilient insulation unaffected by wet and abrasive atmospheres. Saturable reactor control eases the motor into the gear train to bring the mills up to speed.



SIMPLICITY, RELIABILITY, LOW COST are big benefits of plant's radial distribution system using metal-clad switchgear with protective Type DH drawout air circuit breakers. Switchgear permits independent operation of plant departments, facilitates metering. Indoor switchgear is used in this plant.



CONTINUOUS CHECK on performance is maintained with Westinghouse recording and indicating instruments on many phases of plant's automatic operation. These sensitive instruments keep production records accurate and help plant personnel hold production at maximum output without overloading the equipment.

ELECTRICAL GOALS WITH WESTINGHOUSE

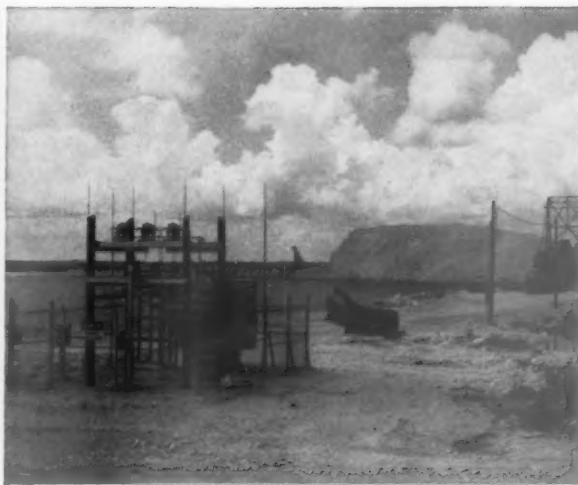
At its Miami site, Lehigh Portland Cement Company has built a highly modern plant to effect economies in cement production. Helping to bring about these economies are the reliability, safety and low maintenance of the plant's electrical system. Here are some of the ways in which Westinghouse planning and equipment achieved these system goals:

- All equipment was selected to provide adequate, uninterrupted service for today, yet provide for easy, economical expansion to meet future demands.
- Westinghouse indicating and recording instruments are used in the plant for on-the-spot checks of processes.
- The Everglades site is located in a humid area and was under water most of the year. Even when the plant grade was raised, water seepage could cause damage to the underground electrical system. The design of Westinghouse equipment, special watertight manholes and rigid steel duct encased in concrete overcame this difficult problem.
- A simple, radial system distributes power from the main substation to the plant's operating departments. Small, low-cost power centers located at load concentrations achieve lower voltage drop, less power loss, more flexibility and greater reliability.
- Maximum protection for personnel and equipment at the quarry is provided by special system grounding precautions.
- The outdoor substation proved more economical than one indoors or under a roof.
- Distribution voltage for the plant is 4160 volts, making possible savings in initial cost.
- Voltage drop during starting of the 1250-hp ball mill motors—the most severe system requirement—is estimated to be only 5.6%, which minimizes the malfunctioning of this and other electrical equipment.

Westinghouse



OPERATING RELIABILITY is possible with small, economical indoor Inerteen® Power Centers installed in clean, pressurized rooms. Location at load concentrations minimizes voltage drop and losses.



MAXIMUM PROTECTION is afforded personnel and equipment in the rock quarry by use of safety-resistance grounded systems. Portable switch houses immediately isolate faulted cable and equipment.

HOW LEHIGH PORTLAND HIT ITS GOALS *(continued)*

The down-the-line planning and careful coordination of equipment that went into the Lehigh Miami plant are basic to the Westinghouse approach to electrical equipment for top cement production. For more information, call your nearby Westinghouse representative today . . . or write Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa. You can be sure . . . if it's Westinghouse.

J-96149

Westinghouse



RELIABLE, FINE CONTROL is provided by Westinghouse equipment for this overhead traveling crane using an adjustable voltage, direct-current bucket drive. Westinghouse control helps keep raw materials flowing through the plant smoothly.

AUXILIARY POWER generated by a 438-kva, 0.8 p-f diesel generator. This unit can tie in to supply critical loads, such as air compressors and lighting, subsequent to a power failure.



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ROCKY'S NOTES

by NATHAN C. ROCKWOOD



Highway lore complete in one volume

WHEN THIS WRITER started his career with ROCK PRODUCTS, aggregate producers were few and far between. The largest and most successful were often former employes of the railway companies—from the maintenance-of-way or traffic departments—where they had had an opportunity to become acquainted with the railways' needs and purchases of ballast. There was practically no demand for commercial material for highway construction; the Federal Bureau of Public Roads had just been started, and many of the States still had no highway departments.

The 1920's changed all that. The railway maintenance-of-way departments commenced to find out, that as the roadbeds were pounded down by heavier and heavier traffic, they became so consolidated that they no longer swallowed as much ballast as formerly. What saved the ballast producers was the sudden increase in the demand for highway construction aggregates; and quite naturally many of the new producers in the sand, gravel and crushed stone industry were graduates from the highway departments of the various states. These men still constitute a goodly proportion of the successful producers today.

Certainly, no producer of materials used in quantity for highway construction can neglect learning as much as possible about highway engineering and the demands it makes upon producers. Hence, we believe the new "Highway Engineering Handbook,"* edited by Prof. Kenneth B. Woods, head of the School of Civil Engineering, Purdue University, should be very useful to many readers of ROCK PRODUCTS. Why a volume of about 1700 pp. and nearer the size and weight of a college dictionary should be called a "handbook" is something we cannot fathom! However, many "Engineering Handbooks" are getting to be of that size.

The editor (Prof. Woods) says in his preface

*McGraw-Hill Book Co., 330 W. 42nd St., New York City 36, price \$25

that the book is designed for materials producers, among others, who make highway engineering their business or profession. He defines the scope of the subject matter covered as administration, finance, planning, soils, materials and materials mixtures, design, construction, maintenance, landscaping and traffic operations. The 1700 pp. (we had to count them) are divided into 28 sections, each paged separately, and each contributed by a specialist in the subject covered in his section. The reader will find many familiar names, from the authors' previous contributions to the proceedings of ASTM, the Highway Research Board, ASCE, many periodicals, etc.

While all of the book contains much of interest and value to many of our readers, we will confine our comments particularly to some of the sections which refer to materials used in highway construction and maintenance. Among these is Section 10 on soil explorations, by George W. McAlpin, assistant deputy chief engineer, and William P. Hofmann, director of the Bureau of Soil Mechanics, both of New York State Department of Public Works. We conceive this to be of interest to aggregate producers who, in the future, will be more and more concerned with discovering new sources of aggregates. Hence, they must know something of the methods to be employed in searching for materials through all the scientific knowledge available including, primarily of course, subsurface exploration which is treated in considerable detail.

Section 15 deals with contracts and specifications, by Maurice Grunshky, associate, and Bernard Rosenblum, chief of specifications, both of Tippets-Abbott-McCarthy-Stratton, engineers and architects, New York City. This section contains a digest of the law and of the technical details in writing and executing highway construction contracts, with which certainly the materials producer as well as the contractor and the engineer should be familiar.

Please turn to page 134



Link-Belt Speeder King-Size Models

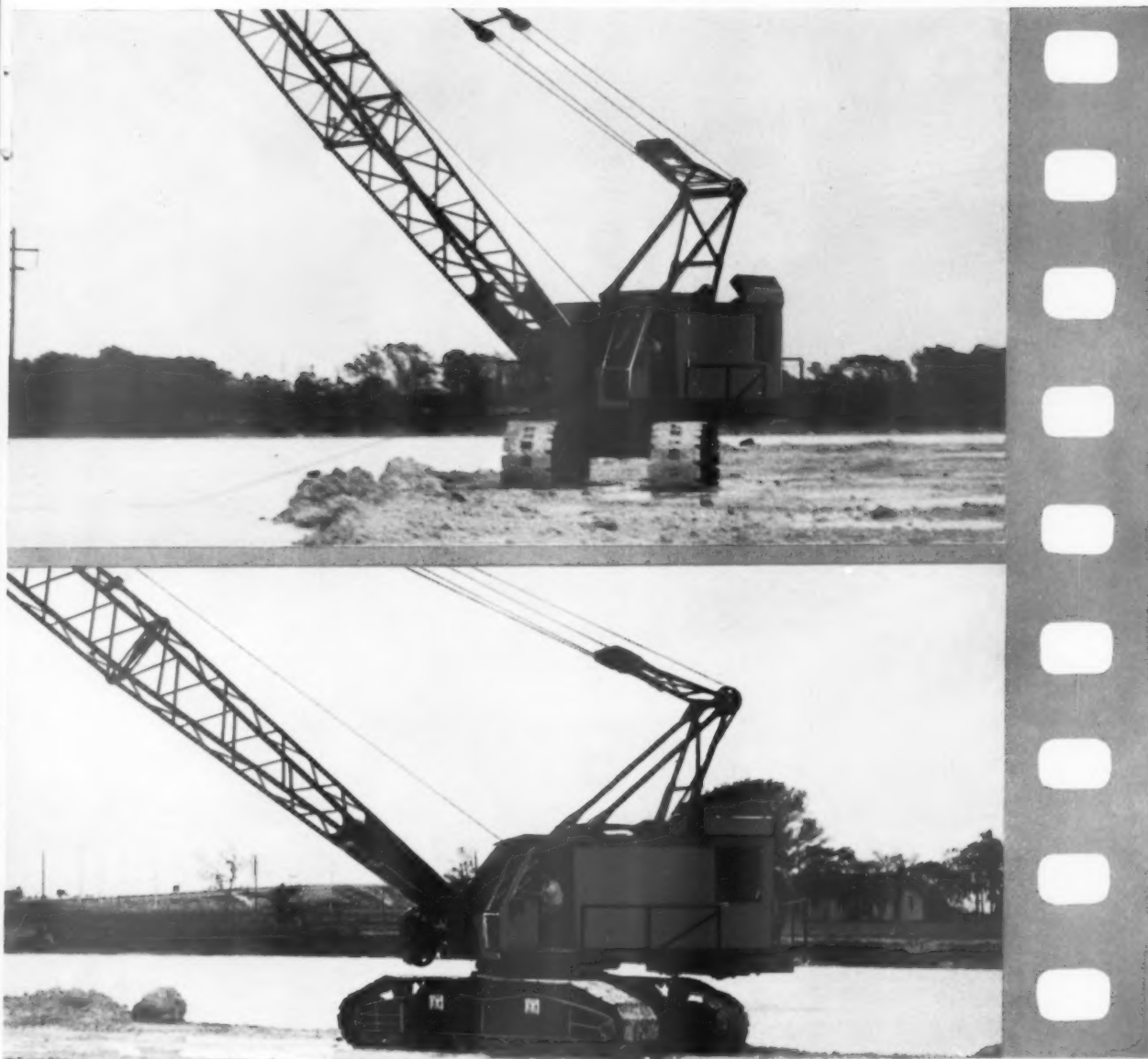
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There's Link-Belt Speeder precision, extra size in every component. More live weight — more strength, stamina, too, in the all-welded, stress-relieved upper and lower frames. Powerful springs individually set the traction brakes for positive steer... also act as automatic digging locks. No danger of run-away.

Other important Link-Belt Speeder user benefits are hydraulic split-second power shifting from swing to travel; free spooling drums for crane-dragline work; quickly telescopic or removable side frames for faster, easier job-to-job transportability.



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LINK-BELT SPEEDER



21 crawlers



6 truck cranes

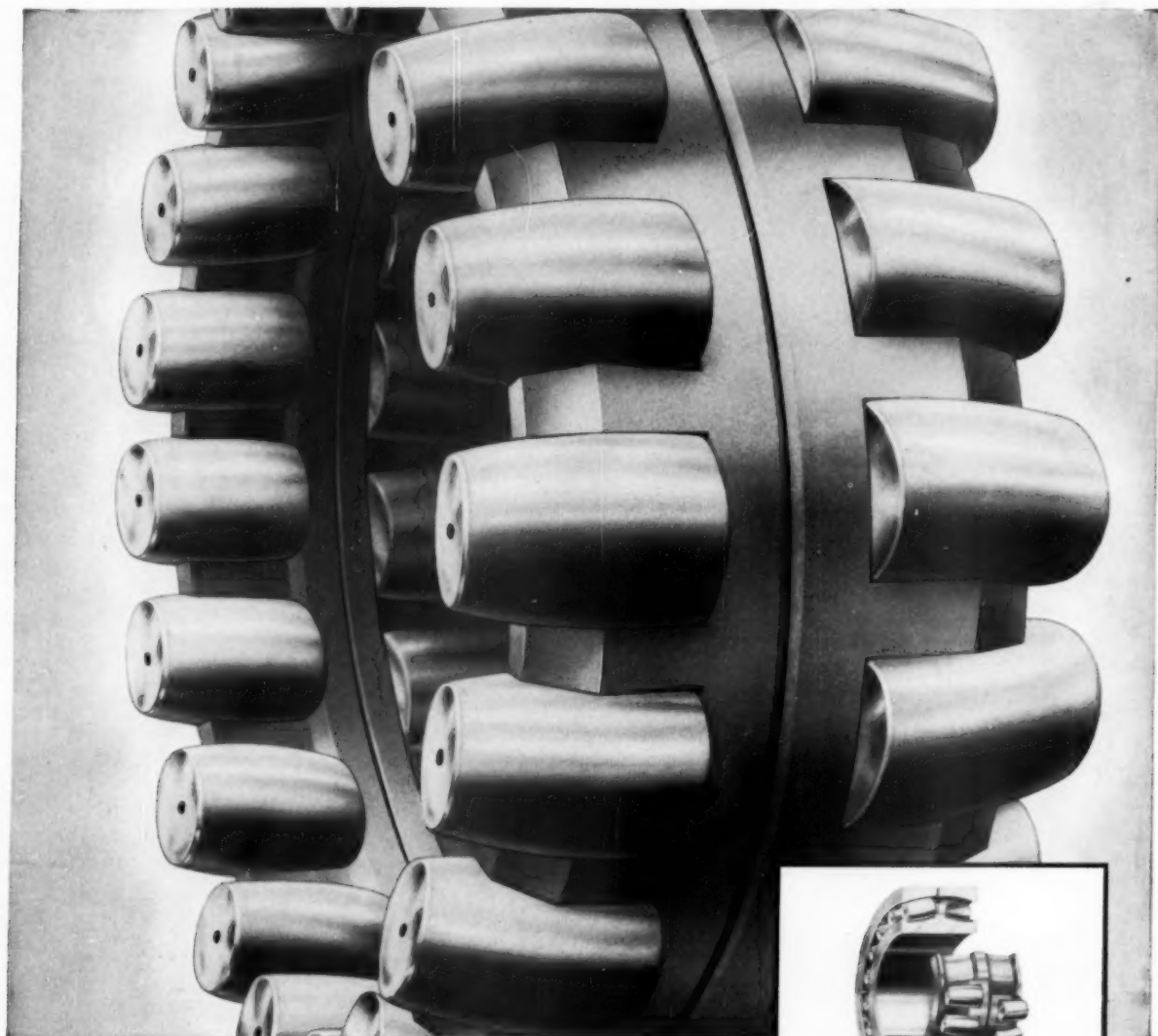


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ROCK PRODUCTS, August, 1960



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The two land-riding cages in Torrington Spherical Roller Bearings assure proper roller spacing and guidance, even under rugged conditions-of shock load and sustained high speeds. These fully machined cast bronze cages operate independently. Their design eliminates drag on rollers. These high-strength cages help bearings give longer life by providing low friction, smooth running and cool operation. Highly effective and generous lubrication of all contact surfaces is achieved with the open-end cage design.

The result: Torrington Spherical Roller Bearings are built to give extra years of unmatched service life in heavy-duty applications. Torrington's long experience in design, engineering and manufacture of every basic type of anti-friction bearing provides the finest spherical roller bearings available. You'll find it pays to standardize on Torrington.



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- size-stabilized races
- fully machined land-riding bronze cages
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THE TORRINGTON COMPANY

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TORRINGTON BEARINGS

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WASHINGTON LETTER

by EDGAR POE

World's largest Concrete mixing Plant operating

The world's largest concrete mixing plant is functioning at the site of the Dulles International Airport, 23 miles west of the Nation's Capital. The jet-age airport, the newest and largest on the globe, will be opened sometime in 1962 at a cost of nearly \$100 million which Congress appropriated.

Two of the airport's four runways, 11,500 ft. long and 150 ft. wide, have been completed. Concrete for the complete runways was poured in six strips, each 25 ft. wide; the two outer strips are 12 in. thick, and the two inner strips are also 12 in. thick.

The Federal Aviation Agency, which is supervising the construction work, asserts that the giant mixing plant employs three 10-cu. yd. mixers. Concrete is poured from the mixers into dump trucks and sped to the runway or taxiway.

Stone for the runway base and for the concrete is hauled from the adjacent quarry. The huge crushers process stone for 5,000 yards of concrete daily. Sand used in the concrete mixture, however, must be shipped from Richmond, Va., more than 100 miles away. The runway base is 9 in. of crushed stone.

Future plans call for a fast 27-mile long expressway from downtown Washington to the airport with the Blue Ridge Mountains in the background. Fifteen miles of road were closed, 1,200 acres of woodlands were cleared and 580 buildings, including houses, barns and silos, were demolished before excavation began.

High jobless Areas obtain Appropriation

The White House and some Republican leaders are divided over the amount of money that should be earmarked for depressed areas. A number of Republicans and Democrats are advocating that at least \$250,000,000 be spent during this election year in areas of high unemployment. However, the White House, through its Bureau of the Budget, feels that \$57,000,000 will do the job.

The Senate approved a bill calling for \$250,000,000, but the amount was reduced in the House.

President Eisenhower sent word to Capitol Hill that he would be forced to veto a bill carrying \$250,000,000. A Pennsylvania Republican Congressman, James E. VanZandt, declared: "We're getting tired of the attitude of some in the Administration about the unemployment situation."

Sharp gas tax Change results From small cars

No one can foretell the full impact of what the small car eventually is going to be in the United States, but tremendous sales are assured for the next few years. Sales the past year have been greater than originally seen by some automotive manufacturers.

As a result of the success of the small cars, automotive economists declared that they are causing a revolution in gasoline consumption. Therefore, the impact may result in a major drop in federal and state gasoline taxes.

Appearing before the Highway Transportation Congress in the Nation's Capital, automotive economists agreed that the potential lower tax revenues could lead to a clamor for higher gasoline taxes. Officials of the Transportation Congress maintain that 43¢ of every dollar collected from highway users are now diverted to non-highway purposes. They called for stopping the diversion.

Collective Bargaining Is misnomer

A one-year study of "Inflation, Unions and Wage Policy," by the U. S. Chamber of Commerce's Committee on Economic Policy, resulted in disclosing some interesting observations. The Chamber report, borne in a 44-p. pamphlet, strongly favors voluntary collective bargaining. It points out that so-called free collective bargaining often is a misnomer. Why? Because union officials now have so much excess market power that settlements are pushed upon relatively weak employers.

The report, directed by Dr. Emerson P. Schmidt, director of economic research of the National Chamber, tosses out a new interpretation of inflation and of the power of union officials. He main-

tains that it will take some time for the dual power of union officials to be evaluated and understood.

The public had widely, but erroneously, assumed that the conflict is between employers and employees, but actually the impressive concessions have been gained ultimately at the expense of the consumers generally, the study avers. It added that the public does not yet suspect the fundamental nature, the extent and the unintended consequences of the tremendous economic and political power that the public itself has put in the hands of union officials. The correction of this excess power will not and cannot come until the public does understand what has gone wrong.

Continuing, the report admonished: "We as citizens need to learn that we are not getting the collective bargaining which was intended, but we are getting dictated settlements that are not in the public interest."

By granting union officials sole bargaining rights and compulsory union membership and allowing the threat of and the use of violence, coercion and force—as ever present weapons—the collective bargaining which we have gotten is not what it was intended when the government put its weight behind the union movement beginning in the 1930's, the report contends.

Billion plus Available for Work projects

A total of \$1,185,320,000 for construction for our armed forces in the United States and in foreign lands was made available by Congress for the new fiscal year that began July 1. The bill signed into law by President Eisenhower made these authorizations: For the Army, \$143,561,000; Navy, \$127,566,000; Air Force, \$727,305,000; Defense Department, \$20,000,000; Reserve Components, \$50,122,000, and deficiencies, \$110,076,000.

States receive Slightly higher Road fund quotas

Statewide quotas for Federal-aid highway contracts under the \$2,873,613,000 ceiling imposed for the current new fiscal year that began July 1 are now in the hands of officials of the 50 states. The states together will be able to commit themselves to spend about \$718 million in each quarter of the fiscal year. This includes a total of \$2 billion for the 41,000-mile interstate highway program and \$873,613,000 for another 800,000 miles of the primary, secondary and urban roads.

Ninety percent of the cost of the interstate high-

ways is paid by the federal government, and the states pay the other 10 percent, but the states have the costly responsibility of maintenance. The cost of the so-called ABC program is a 50-50 proposition between the states and the federal government.

Secretary of Commerce Frederick K. Mueller, the top boss of the Bureau of Public Roads, explained that ceilings on contract obligation authority were necessary to keep the road program on a pay-as-you-build basis. Under the Federal-State highway program, the various states let the contracts and then send the Bureau of Roads a bill for reimbursement.

The 1961 fiscal year total is a little higher than the last fiscal year because of the 1¢ a gallon federal increase in the gasoline tax which was collected starting October 1.

Supreme Court Reverses Board On union ruling

The Supreme Court of the United States holds that a union which represents only a handful of workers may still picket a firm in an effort to gain recognition. By its ruling the tribunal reversed the National Labor Board, which had previously held that minority picketing would result in loss of business which would put pressure on workers to join. Thus, such picketing would be illegal coercion under the Taft-Hartley Act. Reversing the Board, the high court said such picketing is legal, but picketing must be peaceful.

Jersey Turnpike Traffic heaviest

The New Jersey Turnpike traffic (46,199,339 vehicles) was greater than any of the 59 toll highways in the United States in 1959. On the other hand, N.J. toll collection of \$33,321,270 was exceeded by yields from the Pennsylvania Turnpike totaling \$40,208,946. Eighty-six percent of the traffic on the 59 toll facilities consisted of automobiles, the remainder trucks and busses.

Eight billion Spent so far on Interstate roads

Thus far, about \$8 billion has been spent on the construction of the interstate highway system since July 1, 1956. During the same period, work on the so-called ABC highway system has cost almost \$6 billion. Construction projects involving 96,563 miles in the ABC program have been completed since July 1956, and contracts involving 25,000 additional miles are under way.

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ROCK PRODUCTS, August, 1960

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Model C-6 is powered by a dependable GM 6-71 engine; delivers 211 net h.p. to power train... proven Torqmatic Drive provides full-power shift and fast response... almost unbelievable ease of handling... fast-as-a-fox maneuverability... fine visibility... exceptional balance with heavy duty attachments... accessibility for servicing that results in more productive time on the job.

The C-6 has the speed, power and maneuverability to handle every kind of tractor job... ripping, dozing, push loading, clearing, towing and other heavy work. Many major components including Torqmatic Drive, engine, and planetary drive axle have been job proved in thousands of Euclid earth-movers. Owners say that full-power shift, easy operation and fast response give the C-6 more work-ability than any other crawler in the 200 h.p. class.



Facts and figures on the Model C-6 and Model TC-12 "Eucs" are available from the Euclid dealer in your area... get in touch with him soon!



Greater Dimension in power and performance... TC-12 has 2 engines that deliver a total of 425 net h.p. ... independent track drive with separate power train and Torqmatic Drive for each track... full-power shift and instantaneous reverse... 8 track rollers... unequalled accessibility for servicing... maneuverability and workability that have set new standards of big tractor performance.



Proven Torqmatic Drives deliver a smooth flow of power to each track... with full-power shift there's no delay for clutching and shifting... change direction with a flick of the wrist... 425 total net h.p. is automatically matched to every job requirement... rigid track alignment maintained by independently suspended track frames and final drives... years-ahead engineering reduces downtime and maintenance costs for a better return on investment.

Crawlers without full-power shift are obsolete... and costly!



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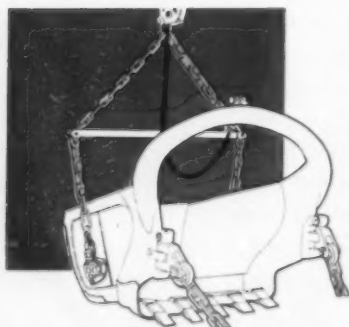
One example of this greater dimension was the introduction of the Model TC-12 Crawler over 5 years ago. Here was an entirely new concept of tractor design . . . two engines, each driving a separate track through its own Torqmatic Drive . . . unequalled power and work-ability . . . performance that set a new standard of crawler productivity . . . ease of operation and servicing that is still unsurpassed in the industry.

Recently the Model C-6 Euclid tractor went into production after the most comprehensive field trials and proving ground testing ever given any new Euclid model. It, too, has Torqmatic Drive and full-power shift as well as many of the advanced design features of the bigger TC-12. And like the "Twin", the new C-6 utilizes major components that have been job proved in thousands of "Eucs" in construction, mine and quarry service. For instance, the Allison converter and semi-automatic transmission "package" has long since passed the pioneering and development stage . . . it's been used in "Euc" scrapers, rear-dump haulers and other models for years. These two Euclid crawlers provide so much more work-ability that they obsolete tractors without the operating advantages of full-power shift.

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Streamlined and rugged, *ESCO* Triple Tapered Dragline Buckets continue to establish new highs for production in all kinds of stripping, excavating, loading or materials rehandling.

This record-smashing performance results from the Triple Tapered Design that reduces friction and makes *ESCO* dragline buckets load faster and dump cleaner with minimum line pull. Materials flow easily into the tapered basket, filling the bucket quickly without voids in the rear. The high, hollow-cast arch allows maximum clearance when dumping. All-welded, rivet-free construction, plus maximum use of alloy steel castings at all critical stress and wear points make these buckets the strongest, pound for pound, and the longest lasting buckets with the lowest maintenance cost.

ESCO Triple Tapered Dragline Buckets are available in a wide range of sizes and weights. Ask your *ESCO* dealer for details, or write for *ESCO* Catalog No. 188. You may also want a copy of *ESCO* Dragline Replacement Parts Catalog No. 108.



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LABOR RELATIONS

A ROUNDUP OF ACTUAL DAY-TO-DAY IN-PLANT PROBLEMS
AND HOW THEY WERE HANDLED BY MANAGEMENT MEN

How would you decide?



When can't you fire a worker for drunken driving?

What Happened: Following his conviction in the Municipal Court for drunken driving, John Jones was discharged by the company for that reason.

He insisted that the company had no right to do what it did for a whole long list of reasons:

1. I was not driving a company car. It was my own.
2. I wasn't on company time.
3. I have no influence in the community. I'm an "unskilled worker" and therefore I can't hurt the company's reputation no matter what I do.
4. I have already paid my penalty for the drunken driving with a conviction by the court.

The company put in a sober plea of its own:

1. We have had the rule for 20 years that anyone guilty of drunken driving would be fired.
2. In the past five years we have discharged three men in accordance with that rule, and none of them had the audacity to take their situation to arbitration.
3. Jones was in such bad shape that he couldn't come to work the

next day. He didn't even notify the company. That deserves a penalty, too.

4. We want sober workers in our place—skilled or unskilled—that makes no difference.

Was the company:

Right? ☐ **Wrong?** ☐

What Arbitrator Dworkin ruled: "It is a matter of 'common law' applicable to industrial relations that what an employee does on his own time is not a subject of regulation by the employer. There may be situations where the employer's business is of so sensitive a character as to require that employees be cognizant, at all times, of the good will of the employer and his relationship with the general public, both during and after working hours. In such instances, the violation of rules governing an employee's conduct, even on the employee's own time, may be the proper basis for disciplinary action.

"There is no question but that an employer may establish reasonable rules affecting the operations of the plant and regulating the conduct of its employees. Generally such rules are designed to operate and to apply during the hours of the employment relationship. They do not customarily extend so as to regulate the conduct of an employee while off duty.

"In this case, however, Jones was engaged as a common laborer, doing yard work. The Arbitrator finds it difficult to reconcile the application of the rule here. While not intending to condone the use of intoxicating beverages while operating a motor vehicle, nor to criticize the company's concern for the consequences of such conduct, a conviction for this would not necessarily affect the employee's ability to perform the duties involved in his job. The Arbitrator, therefore, concludes that the violation of the rule pertaining to drunken driving would not afford just cause for discharge."

Can an employer cut out the coffee break?

What Happened: For 3 years the employees were allowed 2 coffee breaks a day—one in the morning and the other in the afternoon. At each break the workers left their jobs. As time went on, many abuses developed. The most serious problem was that of returning to machines and desks late. So management decided to cut out the coffee break. Instead it substituted perambulating service so that employees could get their coffee at their work. There was a howl of protest. The workers complained:

1. The coffee break is a working condition and you can't just take it away at will.
2. A coffee break is established practice in industry.
3. The new service is not an adequate substitute. We want to leave our work to drink coffee.

Management took time out to answer:

1. A coffee break is not a "right." We gave it voluntarily. What we give we can take away.
2. A coffee break is for coffee. This we are supplying through the "rolling" lunch wagon.

Was the company:

Right? ☐ **Wrong?** ☐

What Arbitrator Reid ruled: "A coffee break is essentially a rest period—a break from the pattern of work—a ceasing of doing what you were doing. The time allowed is to enable the employee to withdraw from labor or exertion for the obvious advantage to the company and the individual of recharging the human physical and mental storage battery. The company is obligated to restore and continue the practice as heretofore carried out, of allowing coffee breaks for the remainder of the contract—unless the practice is changed by mutual consent."

(Continued on page 36)

engine power

BY CATERPILLAR

...MATERNE BROTHERS
CUT SET-UP TIME,
INCREASED PRODUCTION

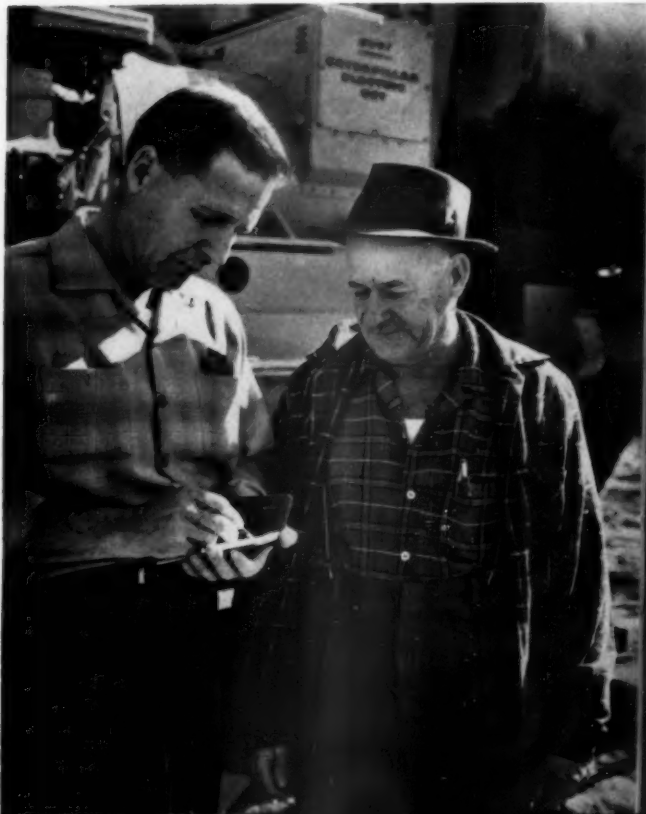


This Cat D397 Electric Set powers gravel crushing plant for Materne Brothers of Spokane, Washington. On this job, road construction for Benton County, Washington, 42,000 tons of gravel in 1½ inch minus and ¾ inch minus are required. To furnish this amount on schedule for the Old Inland Empire Highway near Prosser, Washington, the plant averages 300 tons an hour of 1½ inch minus. It can produce as many as 400 tons an hour when working in the best pits. Their choice of a Cat Engine permits picking the most efficient power for each of a variety of needs—mechanical or electrical.



In this over-all view with the D397 Electric Set in the background away from most of the dust and vibration, the plant is producing with 1 inch and ½ inch screens because more "fines" were needed. The Cat Engine provides power for a 4-foot Symons cone, a 4-foot Telesmith cone, a 30 x 40 Pioneer roll crusher, three 4 x 14 Cedar Rapids screens, two 30-foot loading belts 30 inches wide, eight conveyors with a total length of 400 feet, a 3 x 10 feeder. In addition this power package supplies power for lights and compressor.

Lafey Materne, partner in the firm, tells why Caterpillar was picked: "We've been using Cat Engines for over 25 years. I'm sold on Cat Engines. The good thing is the parts and service—you can get anything for them whether they're 20 years old or one year old. And I like the performance—they're good, dependable engines." This company repowered electrically for convenience—they don't have to move so many engines. The operator just pushes buttons instead of starting engines. A 4 x 14 screen and a 4-foot cone were added after electrifying.



THESE COMPANIES REPOWERED ELECTRICALLY



...CURTIS CONSTRUCTION COMPANY WITH TWO CAT D353s GAINS GREATER PRODUCTION FLEXIBILITY

The two Cat D353 Electric Sets on the job at Entiat, Washington, where Curtis Construction Company, of Spokane, is furnishing gravel for rail and road relocation on a Public Utility District hydroelectric project. One electric set can power the plant, but for a greater degree of crushing both sets are used. The plant produces 2½ inch minus ballast at the rate of 500 tons an hour.

William J. Sipes, superintendent for the Curtis Construction Company, tells why his choice is Caterpillar for his powering needs, "I've been around Cat Engines since 1932. I like them for their durability, simplicity, good service, and dependability."



This view of the plant, with the Columbia River in the background, shows the 24 x 36 Universal crusher, 54 x 24 Pioneer roll crusher, two 4 x 14 Symons screens, a 4½-foot Symons cone, and the 478 feet of conveyors, widths 30, 36, and 42 inches, which are driven by the Cat D353 Electric Sets.

Ask your Caterpillar Dealer to outline the kind of plant you'd have with a Cat Engine. He has one that will give you direct-from-the-flywheel mechanical drive, with a large capacity front-mounted generator for your electrical load. Nine basic Cat Engines from 50 to over 730 HP and from 30 to over 350 KW—plus all of the engineering data you need for a profitable installation—are available. Call him now.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.



LABOR RELATIONS

continued from page 33



Can a worker refuse to do a job unless the company provides extra safety devices?

What Happened: Ben Garlan worked on the same kind of machine for about four years. During that period the company had surrounded the machine with as many safety precautions as it thought necessary. As an added measure the company installed a special "safety bar."

A few months ago a bigger machine was installed and the "safety bar" was eliminated on the grounds that it was not necessary. Garlan went to his foreman and demanded that the safety bar be put back. The supervisor and the safety engineer did not ignore this. They checked with the manufacturer, they looked over the job and machine again and they also queried other companies using the same equipment. All agreed that a safety bar would not add to the safety of the machine. When Garlan was told of this he refused to man the machine and walked off the job. He was given a 3-day layoff. He protested with the following:

1. No man has to work on a job which he feels is unsafe.
2. No machine is perfect. I have a right to demand extra precautions.

The company's claim:

1. We made a thorough investigation and found that the bar was not necessary.
2. We have found no records of any accidents having been caused by the fact that there was no safety bar.
3. Management has the authority to determine safety standards. If Garlan thinks the job is unsafe, let him ask for a transfer—not just walk off the job in a huff.

Was the company:

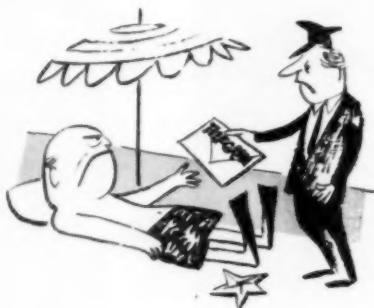
Right? ☐ Wrong? ☐

What Arbitrator Flannagan ruled:

"There is no machine which is 100 percent safe. If the employer were required to furnish an employee with a machine guaranteed not to cause injury, then the wheels of industry would cease to turn.

"The fact that there had not been a single crushing injury from these machines since the installation of the other safety devices; the fact that the machine was not equipped with a safety bar by the manufacturer and that the machine was used throughout industry without such safety equipment; the fact that this employee had operated this machine without the safety bar for a number of years; the fact that the employee was not on incentive and was told by management to take his time would indicate that, under all circumstances, the machine was reasonably safe without the safety bar. The grievant was not justified in leaving his machine. The disciplinary lay-off was justified."

If a death in family occurs while an employee is on vacation, is he entitled to 3 days off for funeral leave?



What Happened: While Dave Daniels was on his vacation, his mother died. He came home for the funeral. When his vacation period was up, he remained away for 3 additional days. On payday Dave found that the company did not pay him for the extra time he took off. Daniels argued that the 3-day leave is granted to all regular employees. "While I was on vacation I was still a regular employee. Therefore I'm entitled to all of the benefits. Pay me."

"Yes," the company agreed. "We do have a policy of paying for three days' funeral leave—but that's when the employee is working. Anything that happens during a worker's vacation time

is his own problem. We don't want to seem harsh, but also, we don't want to establish a precedent."

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator Midonick ruled: "In effect, Daniels lost three working days of his vacation and is entitled to demand up to a maximum of three such days of paid vacation subsequent to the vacation originally scheduled, but lost due to the death of his mother."

If a foreman makes a mistake, is the company liable?

What Happened: A group of employees worked on two kinds of jobs. One job was "incentive," the other was "hourly rated." When there was no work for them on incentive operations, they were shifted to the lower-paid hourly duties. In the morning they were usually put on incentive work.

One day when the workers clocked in, there was no incentive work ready for them. The foreman had made a mistake in planning and had no assignments to give out when the men appeared. So they were put on regular hourly work.

The workers put in a claim for the difference between the hourly and the incentive pay. They said:

1. We always got incentive work in the morning, so you established a precedent.
2. If the foreman made a mistake by improper planning, the company should make good.

The company didn't see it that way at all, and countered:

1. There's no written guarantee that all morning tasks are to be on incentive.
2. If the foreman made a mistake, why should we "take the rap" for it!

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator Hilpert ruled: "The company is not obligated to maintain incentive earnings for those employees because the contract makes no provision for such payments. While a supervisor acts for the company, what the workers are asking for is that management discipline its foreman for his error by paying the incentive rate. This is illegal. The employees are not entitled to the difference between hourly and incentive pay."

END

ALLIS-CHALMERS



How screens help you win the battle of the specs

Meeting specifications can put the pinch on profits in a hurry in the aggregate business. To make profits, you need the most efficient screens . . . screens that give top performance, low maintenance and operating costs.

Scalping, sizing, washing, rinsing — all of these screening operations get individual attention from A-C engineers. Years of experience in handling specification problems like yours have resulted in a wide range of screen sizes and features, making it possible for A-C to provide the exact screen to fit your application.

Whether you're replacing obsolete equipment or building an entirely new plant, the right screens can help you cut down costs and produce more aggregate that meets specification.

Let A-C engineers tackle your screening problems. Simply send them to us and Allis-Chalmers will submit an engineered recommendation on the most economical screen for your particular job. Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis.

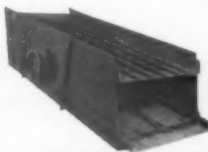
Aero-Vibe, Low-Head, Ripl-Flo and ROM are Allis-Chalmers trademarks. A-1352



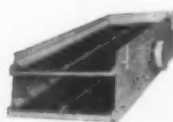
AVS Aero-Vibe inclined screen for economical sizing, up to 1½ inches, wet or dry.



Low-Head horizontal screen for efficient coarse to fine sizing (wet or dry), rinsing, washing, dewatering, media recovery.



XH Ripl-Flo inclined screen for cost-saving scalping and coarse sizing, wet or dry.



SH Ripl-Flo inclined screen for light scalping, coarse or fine sizing (wet or dry), rinsing or washing.



XXH ROM inclined screen, a brute for tough primary scalping jobs and high tonnage.

Enter 1013 on Reader Card



Even moving a blade-full of shot-rock around the curve, there's no hesitation, no sluing to spill the load. The TD-25's operator has separate speed control of each track to get full-capacity performance, full time. And only the new TD-25 has the power plus of the direct-start, turbocharged DT-817 International engine—that delivers 230 high-torque hp!

HOW POWER-STEERED, POWER-SHIFTED . . .

TD-25 takes

—on California mining operation

Even before all the blast dust has settled, this International TD-25 is slamming tons of shot-rock from the benches, so trucks can resume hauling to the processing plant. Then, at this gypsum mine in California, the "25" takes over the "shovel-feeding" chore—dozing full blades of rock upgrade, downgrade, and 'round the curves, to help keep the big dippers swinging full. And in between times, the "25" takes over its third tough project: benching new haul road around mountain slopes!

Three slam-bang rock operations to handle—it's a made-to-order situation for the Planet Power-steered TD-25!

"Dead-track drag" eliminated! You don't brake a track and "half-kill" your pull-power to turn, as you do with king-sized clutch-steered crawlers. With Planet Power-steering you simply change the speed of one TD-25 track—on-the-go, and with 2-finger ease! Around comes the fully-loaded TD-25—with "live" power on both tracks and both tracks pulling. Load-limiting "dead-track drag" is eliminated!

And combined, on-the-go Hi-Lo power-shifting lets you match power to load, instantly—forward or reverse. Just shift one track to high range—the other to low—to do slope-hugging, full-bite benching, or to operate straight ahead with off-center loads!

The "25" is platformed on new 7-roller tracks with double-box-beam frames. The design provides super undercarriage strength for slam-bang conditions—strength to match the full effort of the direct-start, high-torque DT-817 International Diesel engine.

Power-steer and power-shift the TD-25 with king-sized loads. Measure the bonus capacity you get with exclusive Planet Power-steering and Hi-Lo power-shifting. See how this control combination enables you to outearn other big rigs up to 50%. Then measure what it means to get this double-barreled advantage *only* in the TD-25—and as standard equipment *to boot!* Let your International Construction Equipment Distributor demonstrate.

International Harvester Co.
180 North Michigan Ave.
Chicago 1, Illinois
A COMPLETE
POWER PACKAGE



**International
Construction
Equipment**



"Boulder-dozing" after blasting—

The TD-25 does some "blasting" itself to move "big-as-a-house" hunks of rock aside. Heavy-duty TD-25 Dura-Rollers defy the rock-dozing "grind"—with the industry's thickest shells to prevent flexing—positive grit exclusion—and 1,000-hr.-interval lube capacity!



Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combinations for top profits, anywhere! See your International Construction Equipment Distributor!

over three slam-bang rock jobs



PEOPLE IN THE NEWS



Walter B. Lenhart retires

AFTER MORE THAN 35 years as associate editor and western editor of ROCK PRODUCTS, Walter (or Len as he is familiarly known to many of us) has retired from active participation in the field, to a well deserved rest. However, we are happy to announce that he will continue to serve ROCK PRODUCTS as consulting editor. Widely known in the rock products industry, Walter, as a roving editor, was in the field continuously and knows the industry intimately. His articles on plant operations and processing over the years have proved invaluable to our many readers.

We, as well as their many friends in the industry, sincerely wish Walter and Ann Lenhart the best of health and success in their future plans.

Riverside Cement announces executive appointments

DAVID C. HONEY has been named executive vice president of the Riverside Cement Division of American Cement Corp. He was formerly vice president for manufacturing. Mr. Honey joined Riverside in 1954 as assistant

to the general manager and in 1957 became assistant to the president.

Lawrence J. Ramer has been promoted from assistant to the president to vice president for marketing. He will be responsible for all sales, promotion and distribution activities. Mr. Ramer joined Riverside in 1957 as assistant to the vice president and general manager.

Larry L. Conley has been re-elected vice president and made adviser to the president and to the marketing vice president. He has been with Riverside since 1927, starting as a salesman in the San Diego area. In 1948 he became assistant sales manager and three years later was named sales manager. He has been a vice president of the company since 1958.

McCord succeeds Kimmel as PCA district engineer



GEORGE K. MCCORD (photo) has been appointed Wisconsin district engineer for the Portland Cement Association. He succeeds W. D. Kimmel who has retired after more than 25 years of service with PCA.

Mr. McCord joined the Ohio-West Virginia district in 1946 as a field engineer. Later he was promoted to statewide paving engineer and then field

engineer supervisor. He holds a degree in mechanical engineering from Case Institute of Technology and is a registered professional engineer in Ohio.

Mr. Kimmel joined PCA in 1923 and since then has become a recognized authority throughout the Midwest on field engineering problems. Prior to joining the Association he was affiliated with the Michigan and Nebraska State Highway Departments.

Valley Dolomite names director of research

JOHN P. HOLT has been appointed director of research and development for Valley Dolomite Corp., St. Louis, Mo. He was recently manager of market development at Basie, Inc., Cleveland, Ohio.

Universal Atlas promotions

NORMAN C. LUDWIG, research associate at the Buffington, Ind., laboratories of the Universal Atlas Cement Div., has been appointed manager-manufacturing research, in the raw materials and manufacturing division at Buffington. William V. Friedlaender, also research associate at Buffington, has been advanced to the post of manager-products development and quality analyst, in the quality and technical services division at New York City.

Mr. Ludwig joined Universal Atlas in 1937 as a physicist and became a research engineer in 1940. He was appointed section leader, oil-well cement laboratory, in 1950, and five years later became research associate.

Mr. Friedlaender became associated with the Buffington research laboratories in 1937 as assistant chemist. He was appointed research engineer in 1940 and section leader, cement products laboratory, in 1948. He was made research associate in 1955.

(Continued on page 42)

ALL NEW... G-900 TRACDRIL!

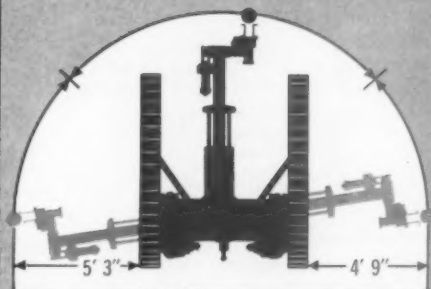
Unmatched versatility . . . drill boom is swung at right angles to tracks and drill carriage tilted inward for steeply sloped conditions.

The all new Chicago Pneumatic G-900 Tracdri1 is the culmination of 5 years of research and wide field experience. This self-propelled drilling unit is maneuverable, rugged and productive . . . a real "drillers drill." Extra large drilling radius because of its 180° horizontal boom swing and dual controls on turret and boom end for quick, accurate positioning of boom and drill carriage give the driller exceptional flexibility. With the sensational 4½" Deep Hole Drill, it quickly sinks 3" holes up to 75 feet.

6 MAJOR EXCLUSIVES OF CP TRACDRILS

- ① "Boarding house reach" lets the drill carriage stretch out 63" beyond tracks to drill true verticals alongside the unit.
- ② Extra-long Oliver tracks, specially designed, provide stabilizing ground contact of 1350 square inches.
- ③ Sure-footedness and maximum traction are assured with five lower track wheels.
- ④ Seven labor-saving hydraulic cylinders ease driller's muscle work, give fluid-smooth action.
- ⑤ Two sets of grouped controls, at turret and boom end, save time and steps for driller, boost footage.
- ⑥ "Dead man" automatic brakes that slam on when tramping throttle is closed, locking unit on steepest slopes or bad ground.

NO EQUAL FOR
DRILL PATTERN COVERAGE



- Full 180° Ground Coverage . . . right or left. New G-900 drills true verticals at 90° angle to tracks.
- Reaches "way-up" for extra high horizontal breast holes . . . to 11 feet.
- Big 85° carriage swing compensates for steeply sloped conditions.
- Keeps snake holes "way-down" and properly inclined . . . no interference from feed motors or crawler carriage structural members.



Full specifications and details in Bulletin SP-3627

Chicago Pneumatic

8 East 44th Street, New York 17, N. Y.

AIR COMPRESSORS • PNEUMATIC AND ELECTRIC TOOLS • AIR-BLAST BITS • DIAMOND DRILLS • REICHdrills • ROCK DRILLS

Enter 1088 on Reader Card

ROCK PRODUCTS, August, 1960

41

PEOPLE IN THE NEWS

continued from page 40



LEFT TO RIGHT: Roger M. Kyes; Col. Henry Crown; Arnold M. Levine; Earl Wilson, and Dr. Perry T. Ford, acting president of Tri-State College and chairman of the board of trustees

Honorary degree conferred on Colonel Henry Crown

Col. Henry Crown, chairman, Material Service Div., General Dynamics Corp., Chicago, Ill., was among the distinguished guests at the recent commencement ceremonies at Tri-State College, Angola, Ind. Col. Crown was present for the vestmental ceremony and actual conferral of the honorary degree, Doctor of Engineering, conferred on him (in absentia) in 1955.

Honorary degrees were also conferred on Roger M. Kyes, vice president, General Motors Corp., Doctor of Engineering; Earl Wilson, New York newspaperman, Doctor of Letters; and Arnold M. Levine, vice president, International Telephone & Telegraph Laboratories, Doctor of Science.

Riverside appoints new plant superintendent

WILLIAM N. KOPENHEFER, chief chemist at the Oro Grande plant of Riverside Cement Co., Los Angeles, Calif., has been appointed superintendent of the new white cement plant at Crestmore, Calif. Mr. Kopenhefer joined Riverside in 1955 as a chemist at the Crestmore plant and two years later became assistant chief chemist. In 1959 he was promoted to chief chemist at the Oro Grande plant.

E. B. Meyer becomes assistant chief engineer

E. BERNARD MEYER has been appointed assistant chief engineer of the Universal Atlas Cement Division, U. S. Steel Corp. He was formerly project development engineer. A native of

Pittsburgh, Pa., and a graduate of Carnegie Institute of Technology with a degree in management engineering, Mr. Meyer joined Universal Atlas in 1939. He has served as assistant chemist, general operating foreman, plant engineer and project engineer. In 1953 he was named assistant engineer, and became project development engineer in 1956.

Perlite Institute elects new officers



NORMAN E. BRAUN (photo), operations manager of the Cleveland Gypsum Co., Cleveland, Ohio, was elected president of the Perlite Institute at its recent meeting in New Orleans. Theron L. Lehr, general manager of Texas Lightweight Products Co., was elected vice president. Directors elected for two-year terms are D. Loring Marlett, vice president of Great Lakes Carbon Corp., mining and mineral products division, and J. C. Kingsbury, vice president of Johns-Manville Perlite Corporation.

R. Joseph Kuklich has been appointed director of promotion and public relations.

Milford Barrick heads Wagner Quarries Co.

MILFORD H. BARRICK is the new president of Wagner Quarries Co., Sandusky, Ohio. He has been sales manager of the company for the past seven years. Prior to that he was purchasing agent for France Stone Co., Toledo, Ohio.

OBITUARIES

William A. Cavanaugh, sales manager and vice president of the Buffalo Crushed Stone Corp., Buffalo, N.Y., died May 8 in Boca Raton, Fla., where he had resided since his retirement in 1958. He was 68 years old. Mr. Cavanaugh joined Buffalo Crushed Stone Corp. (now a division of Houdaille Industries, Inc.) as a shipping clerk in 1919, and was promoted to sales manager and vice president in 1944.

Wade Lowell Donaldson, assistant Southern sales manager, and James Albert Craft, sales representative for the middle Tennessee district of Penn-Dixie Cement Corp., New York, N.Y., died recently as the result of an accident while en route to Nashville, Tenn., on a business trip.

Louis Edward Schneeberger, retired assistant secretary and assistant treasurer of Louisville Cement Co., Louisville, Ky., died June 7. He was 71 years old and had been associated with the firm since 1905.

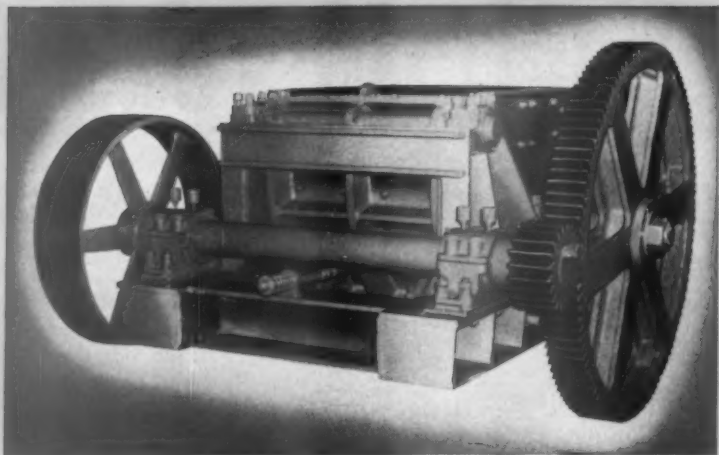
Weston M. Carroll, former vice president and treasurer of the J. E. Carroll Sand & Gravel Co. and the Niagara Sand & Gravel Co., Buffalo, N.Y., died May 10 at the age of 64. Mr. Carroll was also general superintendent of the Buffalo Gravel Corp.

Eber E. Jaques, general sales manager of Consolidated Rock Products Co., Los Angeles, Calif., died suddenly on June 5 at the age of 53. A graduate of the University of Southern California, Mr. Jaques joined Consolidated Rock in 1951 and was promoted to general sales manager in 1957.

Jack Moffett, a research chemist at the M. J. Grove Lime Co., Lime Kiln, Md., died suddenly on May 14. He was 35 years of age. A native of West Melford, W. Va., and a graduate of West Virginia Wesleyan College, Mr. Moffett had been with the company for two years.

Arthur W. Richey, retired superintendent of the W. T. Ingram Corp., Jeffersonville, Ind., died June 12. He was 71 years old.

END



PENNSYLVANIA HERCULES

New job-proved single roll crusher brings you lower operating, maintenance costs

Pennsylvania has researched the factors that make single roll



Cast alloy steel roll shell is made in one piece and keyed as well as shrunk on the rollshaft. No segments or renewable teeth to loosen or fall out. Readily accessible teeth are easily built up by welding.

crushing costs mount—and come up with a new machine specifically designed, and *job-proved*, to keep costs down.

Here are just a few high spots of this great new crusher:

- Hopper jams are prevented by the larger hopper opening and spacious throat opening made possible by the contour of the breaker plate.

New automatic toggle release

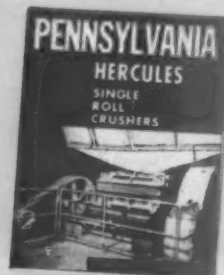
supplies positive release mechanism for breaker plate.

New design of countershaft placement, plus large diameter of the gear improve stress distribution on countershaft bearings.

Hercules bearings are away from the frame. Easy to get at, easy to maintain.

Breaker plate is heavy steel fabrication lined with cast manganese steel wearing plates; guaranteed against cracks and flaws.

If you have a job where a single roll might be used, find out more how this new Pennsylvania Hercules will save you money in more ways than one. Send for new Bulletin 2020.



PENNSYLVANIA CRUSHER DIVISION
BATH IRON WORKS CORPORATION
WEST CHESTER, PENNA.

★ ★ ★

Over 50 years concentrated experience in all types of material reduction makes Pennsylvania your best source of crushers and engineering advice and service. Call on Pennsylvania with your next crushing problem. Representatives from coast-to-coast.

PENNSYLVANIA CRUSHERS

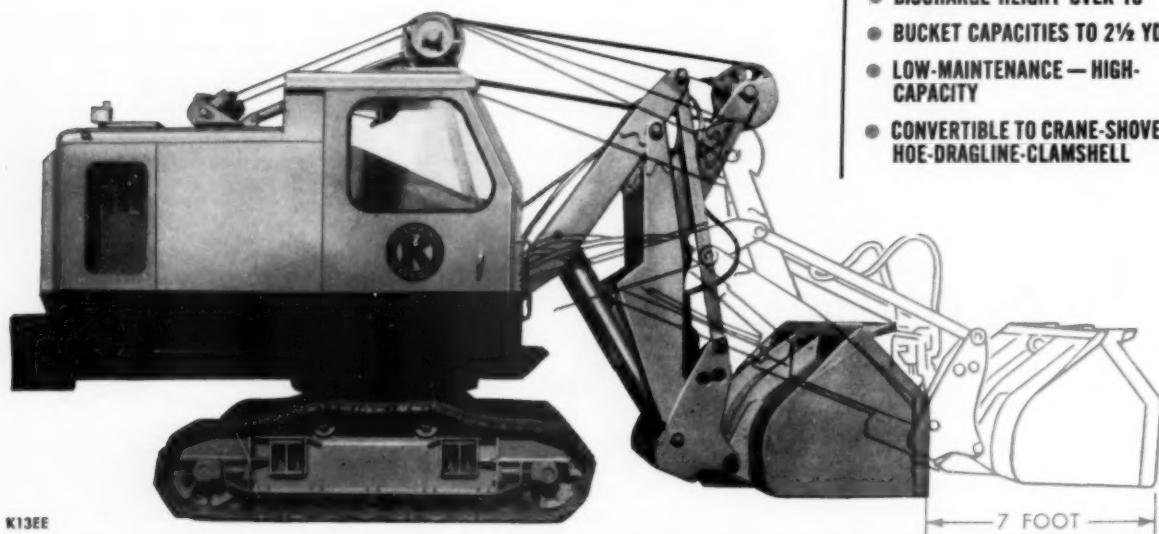


"SKOOPER" Increased



Check these Skooper Features

- 7-FOOT LEVEL CROWD
- REVOLVES A FULL 360° FOR EASY LOADING
- DISCHARGE HEIGHT OVER 10'
- BUCKET CAPACITIES TO 2½ YDS.
- LOW-MAINTENANCE — HIGH-CAPACITY
- CONVERTIBLE TO CRANE-SHOVEL-HOE-DAGLINE-CLAMSHELL



K13EE

Our Production 52%"

*A report on the Koehring Skooper
by W. C. Ratliff
General Superintendent
Sunniland Lime Rock Company
Sunniland, Florida*



"I'D have bet a hundred dollars the Skooper couldn't do a job for us before seeing it in action. It has, though, and enabled us to increase production from 230 to 350 tons per hour — an increase of 52%.

We use the Skooper to load lime rock. We excavate this material below water, stock pile it for a month to get the water out, and then run it to a crusher. While drying, the rock has a tendency to set up, and becomes extremely hard to dig. This is where our Skooper has paid off."

Skooper keeps four trucks busy, cuts maintenance

"Before Skooper, we tried crawler-mounted end loaders, but maintenance was too high. We tried rubber-tired loaders, but they just couldn't dig the rock effectively. We then went to a 1-yd. dragline, but it was too cumbersome and slow — couldn't keep three trucks moving. With Skooper's 7' level crowd and full-revolving swing, loading exceeds 350 tph. We now keep four trucks busy at all times and have time to use the Skooper to keep the haul road clean besides. Average loading time for a 7½ yd. dump truck is 55 seconds."

Digs — Swings — Loads from a Standstill Position



Check the Skooper yourself — check its fast cycling time, low-maintenance operation, and unique excavator-crane convertibility. See your Koehring distributor soon.

**See your distributor about the
1960 KOEHRING EQUIPMENT SHOW
Waukesha, Wis., Week of September 19th.**

KOEHRING
DIVISION OF KOEHRING COMPANY
Waukesha 18, Wisconsin

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INDUSTRY NEWS

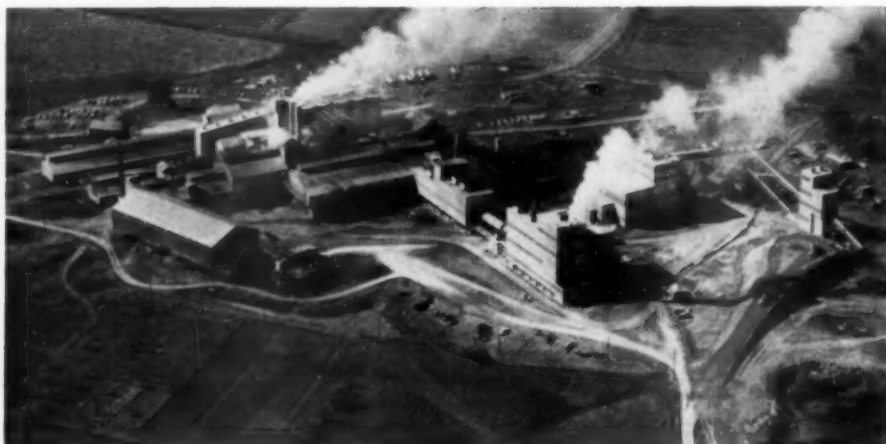


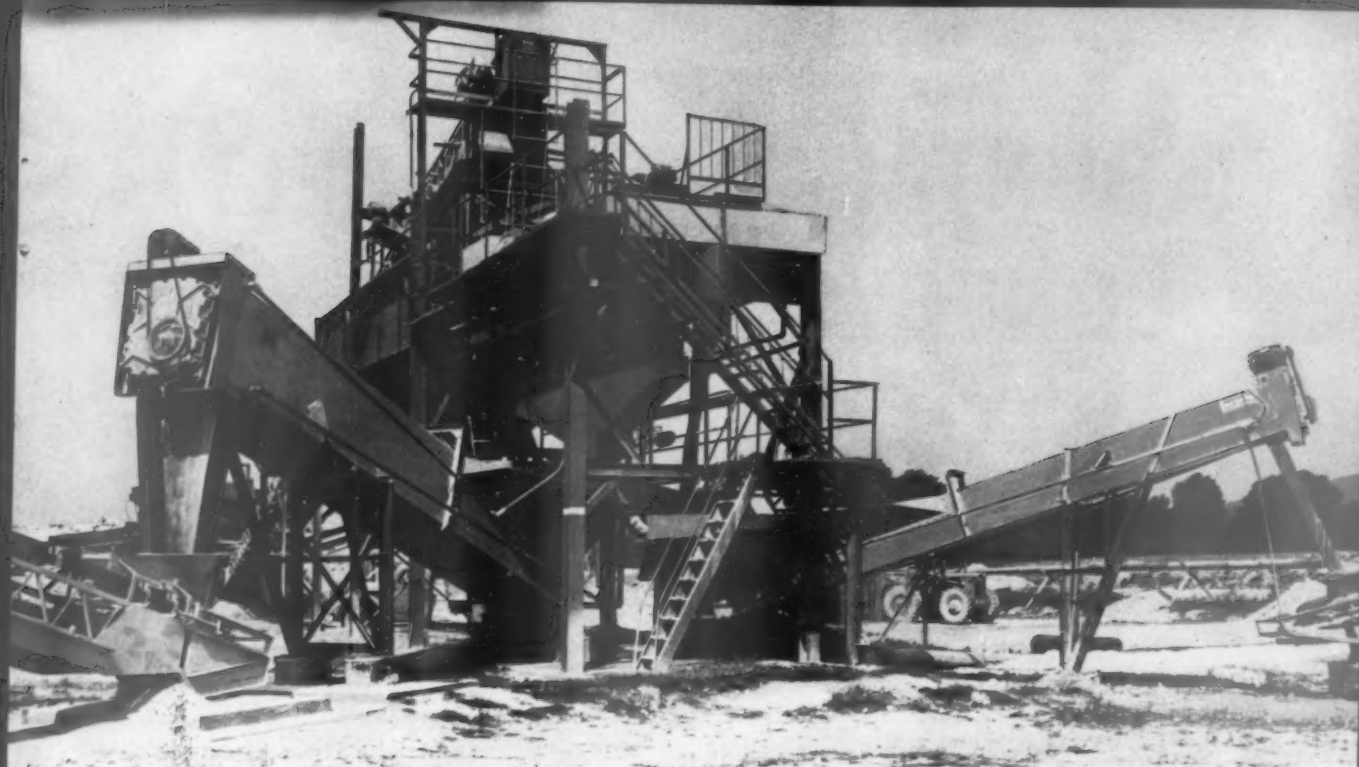
PLANTS IN THE NEWS: These three plants are spotlighted in this month's Industry News. Above is the Fairborn, Ohio, plant of Universal Atlas Cement Co., where a \$775,000 glass-bag dust filtration system is being installed.

At left is the Oxford, Mich., plant of American Aggregates Corp. In the building at center is a new HMS gravel beneficiation system, the company's second in the state of Michigan.

Below is the Middle Branch, Ohio, plant of Diamond Portland Cement Co., which will be identified with The Flintkote Co. following merger of the two companies. Details of each of these developments are contained in the following news pages.

(News continued on page 50)





**"We are having very good results with our
EAGLE EQUIPMENT"—MOUNT CYDONIA SAND CO., INC., FAYETTEVILLE, PA.**

Wherever sand is being processed, it's the same story—owners of Eagle Equipment are effusive in their praise because Eagle Equipment does the job and makes money for them.

Mount Cydonia Sand Co., Inc., is typical—an Eagle Sand Washing - Classifying - Dehydrating Section is economically turning out materials that meet Pennsylvania state specifications for concrete sand.

It doesn't take a Philadelphia lawyer to run an Eagle Sand Section—Eagle's field engineers and factory-trained representatives help producers to trim their washers or washing sections so that they can meet local specifications and operate at a profit.

Mount Cydonia's Eagle Section consists of a 20' Water Scalping-Classifying Tank with 3-cell Collecting-Blending Flume, a 36" dia. x 25' Single Screw Fine Material Washer - Classifier - Dehydrator and a 22" dia. x 25' Fine Material Screw, each handling a different gradation. Get the facts—ask for Catalog 58.

SINCE 1872



EAGLE IRON WORKS

ENGINEERS • MANUFACTURERS

137 HOLCOMB AVE. • DES MOINES, IOWA



**Increase production with an
EAGLE "SWINTEK" DREDGING LADDER**

Traveling chain on ladder passes over intake—acts as screen to keep out boulders and stumps. Cutter bars on chain agitate deposit—increase intake of solids and cut through any clay strata encountered. "Swintek", shown on dredge of Rock River Ready Mix Co., Dixon, Ill., is 10"-50' Heavy Duty model. Send for Catalog 83.

FACTORY - TRAINED DISTRIBUTORS EVERYWHERE!

MOUNTAIN-MOVING BELT CONVEYORS IN 12th YEAR WITH ORIGINAL IDLERS

**Barber-Greene conveyor system still going strong after handling
up to 830,000 tons yearly for Blue Ridge Stone Corp.**

The Blue Ridge Stone Corp., Roanoke, Va., is blasting, trucking, crushing and conveying away a limestone mountain at the rate of up to 830,000 tons yearly.

After trucks make the short haul moving blasted rock from face to primary crusher, a 4-flight, 4,150-ft. Barber-Greene conveyor system hustles the limestone from quarry floor to finishing plant.

President Abney Boxley observes, "We've in-

creased production more than 30% over our old all-rail haulage method.

"Since our Barber-Greene conveyors became operative in 1948, we've had 12 years of dependable service with minimum maintenance and downtime. Practically all 1,500 original idlers are still in service and belt life has been extremely good.

"By including a 6,000-ton surge pile ahead of the No. 4 conveyor, we can operate the plant for

6,000-ton surge pile at end of 700-ft. No. 3 conveyor keeps finishing plant operating 24 hours after quarry shut-down. Rock is reclaimed on 1,600-ft. belt leading to finishing plant.





After double reduction of stone in quarry, limestone gets fast ride upgrade on 30" belt of 1,600-ft. Barber-Greene Conveyor enroute to surge pile and then to finishing plant. 4-flight system totals 4,150-ft.

as long as 24 hours after quarry operations have stopped if we bulldoze the stockpile."

Get this same lowest-cost-per-ton-mile solution to your material handling problems by calling your Barber-Greene Conveyor Specialist. He sells pre-engineered and pre-aligned standardized conveyors plus broad design experience . . . a combination that is preferred throughout the aggregate industry for hard-dollar reasons.

Send For New Idler Bulletin

New 44-page Idler Bulletin describes the more than 800 units available in the complete Barber-Greene line, tells how their years-ahead features bring longer life and greater economy to every job. Ask for your copy today.

Your belt conveyor equipment headquarters

Representatives in Principal Cities of the World

Barber-Greene



Main Office and Plant AURORA, ILLINOIS, U. S. A.
Plants in DeKalb, Illinois, Detroit, Canada, England, Brazil, Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

Finishing plant is last processing point for stone after 4,150-ft. conveyor ride from quarry. Short conveyor

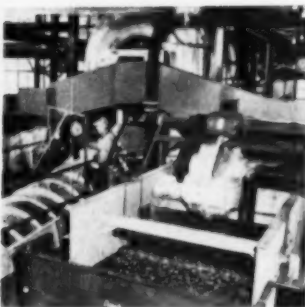
loads truck-loading hoppers. Bulk of output is loaded into railroad cars shown on siding.



Universal Atlas plant installs new filters

UNIVERSAL ATLAS CEMENT CO.'S Fairborn, Ohio, plant, is installing glass bag filters. The \$775,000 project, designed to remove all gas and dust from cement-making operations, is scheduled for completion October 1. Reducing the need for extra-high stacks, the filters are causing a change in the appearance of the plant. The twin stacks, 180 ft. high, will be lowered to 60 ft.

Another HMS plant for American Aggregates



AN OPERATOR at the Oxford, Mich., plant of American Aggregates Corp. is shown checking the specific gravity of the media in the plant's new heavy-media-separation equipment. The separator drum of the system is at top, two discharge conveyors and washers are at right and left, and the spiral densifier is at center left.

The Oxford plant is the latest of American Aggregates' operations to utilize HMS equipment. This brings total capacity of its two Michigan plants—Green Oak and Oxford—to 600 tph. of beneficiated aggregates.

The 12-ft.-diam. x 10-ft.-long drum, drainage and washing equipment, magnetic separator, densifier, demagnetizer, pumps and controls were supplied by Western Machinery Co. and installed by American Aggregates personnel. The latter also erected the steel-frame, aluminum-paneled, three- and four-story buildings which house the components.

Another report, from Columbus, Ohio, concerns additions to the American Aggregates plant there: more loading facilities, new pit dragline, locomotive, and a rebuilt combination desanding and sand plant that increase capacity.

Flintkote acquires cement and lime companies

TWO MORE Flintkote Co. acquisitions were announced in recent weeks. The first was its intended merger with Diamond Portland Cement Co., Middle Branch, Ohio; the second, its plan to buy M. J. Grove Lime Co., Lime Kiln, Md. Both transactions were subject to stockholder approval.

Flintkote's move to acquire Diamond Portland Cement was announced by I. J. Harvey, chairman of the board of Flintkote, and R. D. Raff, president of Diamond. Mr. Raff will continue as president of Diamond, which will be operated as a Flintkote division. The cement company operates two plants at Middle Branch, with rated annual capacity of 3 million bbl.

Earlier, from 1957 to 1959, Flintkote acquired three other cement companies: Kosmos Portland Cement Co., Louisville, Ky.; Glens Falls Portland

ern Cement Div., American-Marietta Corp., as the third judge for the Azbe Lime Award. Mr. Rikard replaces Wallace E. Wing, chairman of the board of Marblehead Lime Co., who died earlier this year.

Mr. Rikard, together with Nathan C. Rockwood, editor emeritus of ROCK PRODUCTS, and C. C. Loomis, president of New England Lime Co., will choose a winner from those submitting papers on lime and its manufacture. The person who, in their opinion, has submitted the most valuable and original fundamental paper will be announced at the NLA operating meeting. The meeting will be held at the Conrad Hilton Hotel, Chicago, Ill., September 29-October 1.

Depletion decision goes against producers

THE LONG-AWAITED Supreme Court ruling on the minerals depletion allowance came June 27 in the case of the Cannelton Sewer Pipe Co. The Justices decreed: Mining stops when the mineral is in such a state that it is ready for industrial use or consumption. Their ruling went against the rock products producers—cement manufacturers, in particular—who upgrade raw materials appreciably in the manufacturing process. The allowance, argue many of these producers, should be based on the higher value of the finished products.

The ruling establishes for integrated companies—those who process minerals into finished products after extracting raw materials from the ground—the same cut-off point in the mining operation for applying the depletion allowance as for companies that merely mine raw materials and do no processing.

Speaking for the Court, Justice Clark said, "We believe the Congress intended integrated mining-manufacturing operations to be treated as if the operator were selling the mineral mined to himself for fabrication. It would . . . be permissible for such an operator to calculate his 'gross income from mining' at the point where 'ordinary' miners—not integrated—disposed of their product."

In making the ruling, the Supreme Court reversed a decision of a lower court which held that mining stops only at the point when the company can sell its products at a profit.

(Continued on page 55)

What's coming in September

Aggregates efficiency includes more than production efficiency. Very often, management effectiveness in labor relations can make the difference between profit and loss.

One of the feature articles in September will tell how rock products producers and aggregates suppliers in New Orleans handled an involved problem in labor relations. This will be the third in a continuing series of articles in Rock Products magazine about labor-management relations.

Cement Co., Glens Falls, N. Y., and Calaveras Cement Co., San Francisco.

The acquisition of M. J. Grove Lime Co. was made known by Mr. Harvey and by W. Jarboe Grove, president of Grove Lime. Mr. Harvey estimated the transaction would cost Flintkote \$5 million in an exchange of stock. The plan is similar to the one to be used in Flintkote's \$15-million merger with Diamond.

M. J. Grove Lime Co. supplies lime products, crushed stone, concrete block, concrete pipe and ready-mixed concrete in northern Virginia and southern Maryland; it is also engaged in street and road construction.

Third judge selected for Azbe lime award

NATIONAL LIME ASSOCIATION has named M. A. Rikard, president, South-

SPECIAL REPORT TO CATERPILLAR OWNERS:



announcing...

BONDED BUY PARTS ASSEMBLIES



PARTS ASSEMBLY
Guarantee Bond

Know All Men by these Presents,

that _____
of _____ (hereinafter called Seller),
is held and firmly bound unto _____
of _____ (hereinafter called Buyer)
in the sum of not exceeding the lesser of FIVE THOUSAND DOLLARS (\$5,000.00) or Seller's price,
with respect to each parts assembly described below, for the payment of which Seller hereby binds
himself, his successors and assigns by these presents.

The Condition of this Obligation is such that Whereas Seller has sold to Buyer the below-described
parts assembly or assemblies originally manufactured by Caterpillar Tractor Co. and reconditioned
in accordance with practices recommended by Caterpillar Tractor Co.:

DESCRIPTION	PART NUMBER	SERIAL NUMBER	SALE PRICE

And Whereas Seller guarantees each said parts assembly against unsatisfactory performance (due to
defective material or workmanship for _____ days after the date of sale shown
below (herein referred to as the guarantee period), the obligation under this guarantee being only to
repair or replace, as Seller may elect, any said assembly which proven defective in material or work-
manship under conditions of normal use during the guarantee period at Seller's expense (including
cost of all necessary materials and labor) up to a maximum of the lesser of Five Thousand Dollars
(\$5,000.00) or Seller's price, with respect to each said assembly, except that the cost, if any, of trans-
porting each said assembly from and to Seller's place of business shall be paid by the Buyer.

Note, Therefore, if Seller, its successors and assigns shall in all respects well and truly perform the obli-
gation under the guarantee recited above, then this obligation shall be void, otherwise to remain in
full force and effect.

THE ABOVE GUARANTEE IS VOID, AND SELLER SHALL BE UNDER NO OBLIGATION
THEREUNDER, IF CLAIM IS NOT MADE TO THE SELLER WITHIN THREE (3) DAYS
AFTER DISCOVERY OF THE DEFECT UPON WHICH THE CLAIM IS BASED.

You can have complete confidence in any Parts Assembly Exchange or Rebuilt Unit carrying the dealer's new Bonded Buy label. You'll receive a Guarantee Bond, backed by the Lumbermens Mutual Casualty Company of Chicago, Illinois, giving the guarantee conditions agreed upon at time of sale. This is further evidence that a Caterpillar Parts Exchange or Rebuilt Assembly is in first-class condition—another way of expressing the careful and thorough workmanship that goes into each of these reconditioned assemblies.

The cost? It compares favorably with the cost of doing the reconditioning work yourself. Often less... because of the availability of special equipment and servicemen's skills in the dealer's shop. Your final net cost is based on parts and labor necessary to put your worn assembly in A-1 condition—same as the exchange unit you receive.

Here's why Cat Reconditioned Assemblies save you money. You trade down time for more go time. Simply:

1. Call your Caterpillar Dealer and arrange for the Parts Assembly you need.
2. Remove your worn assembly and install the reconditioned unit.
3. Put your machine back to work immediately and return the worn unit to your dealer.

Any way you look at it, a Bonded Buy Parts Assembly is a good deal. You get a dependable unit... guaranteed in writing. The cost is approximately the same had you done the work yourself. Time saved can be converted to cash because your machine's working and earning. Contact your Caterpillar Dealer today. Find out what assemblies he stocks (new items are being added daily).

SERVICE TIP:

Never allow your present machine components to become worn to the point where reconditioning is impossible.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

FOR PROFITABLE RESULTS WITHOUT COMPLAINTS

WHICH



READY TO SHOOT — Montgomeryville Stone Company near Philadelphia, Pennsylvania.

3/4 SEC.—There is no sharp report; only the efficient "thud" of explosives at work.

Noise, vibration and flying rock can be a serious threat to your local public relations. New explosives, blasting agents and blasting supplies, combined with recently developed blasting techniques, are helping many operators to overcome these old, troublesome problems.

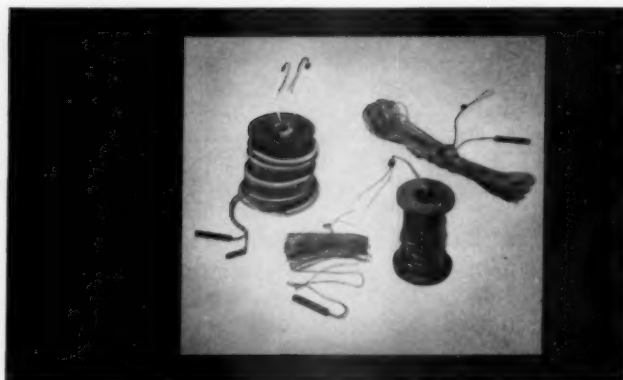
With modern seismograph equipment, vibration has become relatively easy to cope with. Noise and throw, on the other hand, are directly related to blasting control. Techniques such as prolonged confinement of explosive gases, electrical initiation at the point of maximum confinement, and proper use of stemming have greatly reduced air "snap." When you carefully calculate spacing and burden, and correctly load the right explosives, the explosive force exerts its full power in *breaking* rock—not flinging it wildly through the air.

And the same factors that reduce noise, vibration and throw also are responsible for better breakage and lower costs.

Your Atlas Representative, backed by the complete Atlas line (including all types of ammonium nitrate), can help you select the best combination of explosives or blasting agents and the right blasting techniques to give you maximum control on every shot. And remember, blasting control means greater profits.

Our blasting cost chart, slide rules and technical literature are designed to help you achieve maximum control and determine your lowest true blasting costs. Ask your Atlas Representative about them—or write directly to:

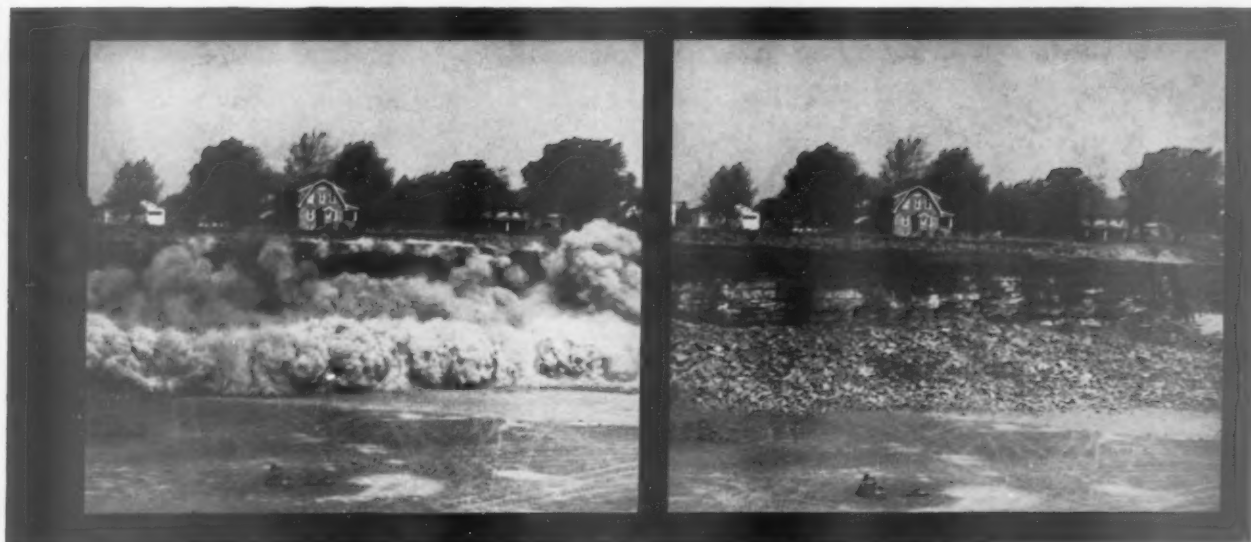
ATLAS POWDER COMPANY
Explosives Division, Wilmington 99, Delaware



ROCKMASTER® electric blasting caps achieve the staggered action which is so important in producing better breakage and control.

FROM NEIGHBORS...

EXPLOSIVE?



1 1/2 SEC. — Solid explosives action without excessive noise, vibration, or flying rock.

AFTER—There is plenty of easy digging in this pile. Explosive was Amocore.®



AMOCORE is a mixture of AN and carbonaceous material, packed with a gelatin core. Insures propagation of any length column.

ATLAS PELLETS, a new physical form of ammonium nitrate, have the density and sensitivity required for efficient AN-oil blasting.

GIANT "75" PRIMERS have the wallop for complete, efficient detonation of both field mixed and plant mixed blasting agents.



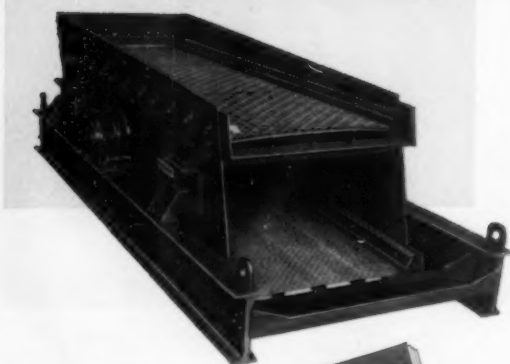
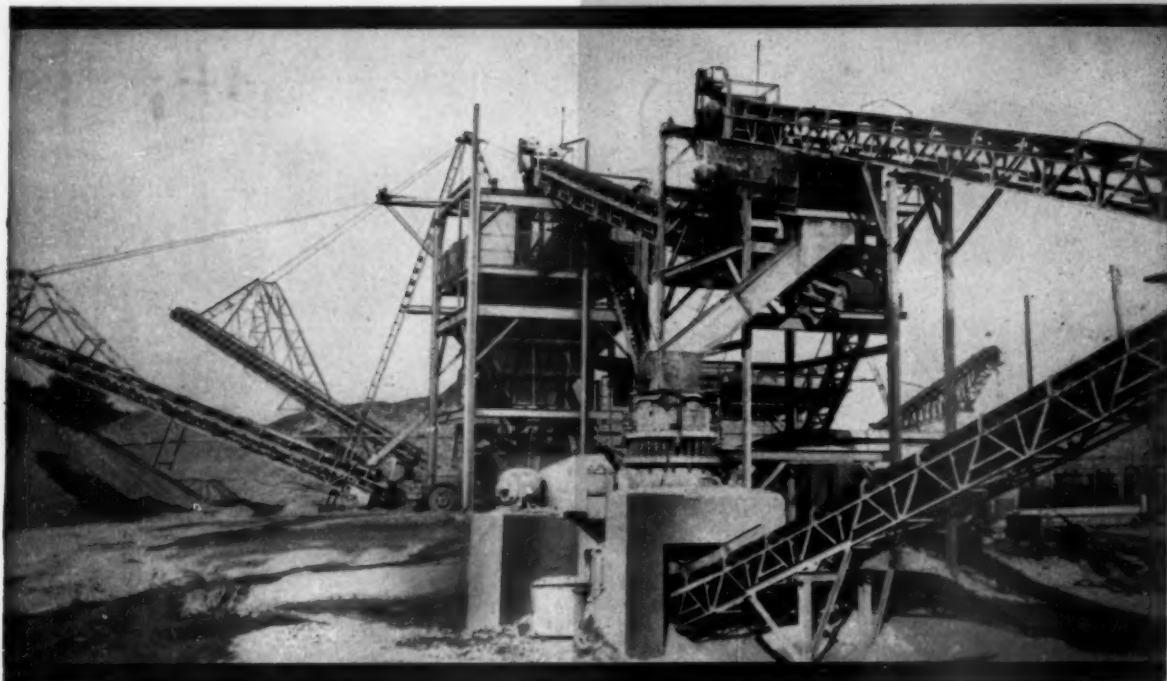
ATLAS EXPLOSIVES

ROCK PRODUCTS, August, 1960

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53

HOLLY MANUFACTURING AND MINING COMPANY
processes 300-400 tons of gravel
per hour with 5 SIMPLICITY screens!



Write for information on
 Simplicity equipment today.



SALES REPRESENTATIVES IN ALL PARTS OF THE U.S.A.
FOR CANADA: Simplicity Materials Handling Limited, Guelph, Ontario.
FOR EXPORT: Brown & Siles, 50 Church Street, New York 7, N. Y.

At the Holly Manufacturing and Mining Company, Holly, Michigan, pit run gravel is brought from the pit to a surge pile on belt conveyors. From the surge pile, a belt conveyor takes the gravel to a Simplicity 5' x 14' Model "D" 2-deck screen. At this point, all oversize material, including rocks up to 8 inches in diameter, is run through a cone crusher and then re-circulated to the screen. A belt then takes all through material to two Simplicity M-11 4' x 12' 3-deck screens where the gravel is washed, sized, then stockpiled to be used as needed. The other 2 Simplicity screens are used for processing special products.

All 5 Simplicity screens have been in operation for over two years, part of the time on a two-shift schedule, with a minimum of down time.

Gravel plant operators are getting quick, economical and dependable processing of their material with Simplicity Screens, Feeders and Conveyors.



ENGINEERING COMPANY • DURAND 13, MICHIGAN

220

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INDUSTRY NEWS

(Continued from page 50)



Executive Committee of National Limestone Institute, Inc.: (left to right) L. R. Falk, Iowa; Powell G. Potts, Kentucky; Thomas E. Lallay, Pennsylvania; Chairman Arthur R. Alvis, Missouri; George A. Zeigler, Maryland; Robert O. Bemis, Ohio; John H. Riddle, Kansas; and President Robert M. Koch, Washington, D.C.

NLI board reviews policies

OFFICERS AND DIRECTORS of National Limestone Institute, Inc., including both Agricultural and Crushed Lime-

What's coming in September

Finance-lease plans for trucks may prove to be a money-saving way for rock products producers to solve their haulage and transportation problems. This is the appeal of the president of one of the country's largest truck leasing services. Equipment leasing is an old idea, but it has become important to industry as Internal Revenue has tightened up its regulations on depreciation of capital equipment. Perhaps this article will give you some valuable ideas.

stone Divisions, made few policy changes at their mid-year board meeting in Chicago June 12-14. They discussed possible revision of short and long-range policies to bring them in line with developments since the board last met in January.

Highlighting the recommended policies was one for getting a program of proper reinvestment depreciation for the industry. Also, the committee on legislation suggested an increased effort to raise authorization for the Agricultural Conservation Program to \$500 million a year.

On promotion, the ALD recommended that news releases feature material from government agencies on agriculture policies, to get that information into the field faster. In addition, the ALD suggested that member companies submit photos on agliming for use in promotion.

The CLD committee on promotion

recommended that a free news service, similar to ALD's, be started, and that material be sent to technical highway personnel, among others. NLI was urged to work for standardization of state specifications, especially on the use of fines.

Membership in NLI continues to grow. The combined boards approved 15 new members to ALD and 37 new members to CLD. An intensified program to increase membership in the Manufacturers' Division was suggested.

Program for the annual meeting, to be held in Washington, D.C., January 17-19, 1961, with a board meeting on the 16th, was discussed in detail. General sessions on sales, aglime program and highway program will be held Tuesday, January 17. The feature luncheon speaker that day will be NLI President Koch. The manufacturers' buffet dinner dance will be Tuesday night, and all day Wednesday will be given to a manufacturers' program.

Senator Case of South Dakota, ranking Republican member on the Senate Public Works Committee, will be featured speaker at the annual banquet Thursday night. Note that the annual meeting will be held at a time to include the inauguration of the new president, at noon on Friday, Jan. 20.

The 1961 mid-year board meeting will be held in Chicago during June. The combined boards will study the possibility of holding later mid-year board meetings at a resort area.

Double highway contract rate for this quarter

THE COMMERCE DEPARTMENT authorized a speedup of the nation's highway building program, doubling the amount of federal funds available to the states for the July-September

(Continued on page 58)

"THIS LUBRICANT WAS THE ANSWER TO OUR MAINTENANCE PROBLEM"

says the MOLYBDENUM CORP. of America

"We use a Hardinge conical ball-mill driven by a large gear and pinion in the processing of tungsten and molybdenum concentrates. Silicious dust from the grinding was absorbed by the soaplike lubricant we were using and formed a highly abrasive compound. Frequent replacements of gears and pinions were major maintenance expenditures. The change to LUBRIPLATE Lubricants was the solution to our problem . . . not a gear nor pinion replacement in four years."

William F. Allen, Works Manager

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE GREASE AND FLUID TYPE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



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ONLY LOADER WITH..

You shift from any one gear to any other—forward or reverse...on-the-go. Allis-Chalmers tractor loaders make fast work far easier for any operator.

It's simple for a tractor loader operator to work faster—get more done. It's just as easy for him to go into a high gear as into a low gear—forward or reverse. ONE LEVER controls both speed and direction. No fumbling around with two or more levers or a combination of levers and foot pedals.

Besides operating simplicity, a tractor loader has *firmly connected axles*—attached to frame with 2-inch diameter steel pins . . . no rolling and shifting under load. *Extra stability* lets operators get and deliver

move ahead with



... SINGLE-LEVER SHIFT

bigger loads with greater comfort. Add *extra reach* for fast, even dumping and you can see why production is higher with an Allis-Chalmers tractor loader. Let your dealer show you. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

The "Big Three" tractor loaders range in size from the TL-14 with 5,300-lb carry capacity to the TL-20 (shown) with 9,000-lb carry. Each has a family of buckets—18 bucket loader combinations in all.



ALLIS-CHALMERS



... power for a growing world

**Philip Beauchamp recently started business for himself,
general contracting in Reading, Massachusetts**



**"I BOUGHT THIS D6 USED.
IT'S MAKING MONEY FOR ME!"**



When a man goes into business for himself, he can't afford to take chances on his first machine, can he? As an operator, Philip Beauchamp was sold on Cat-built rigs, so he dropped in to see his Caterpillar Dealer. There he met a salesman who helped him with some friendly advice and showed him a fairly priced used "Bonded Buy" D6.

Actually, beyond his experience with Caterpillar equipment, the "Bonded Buy" guarantee influenced his decision. This is the safest buy in used equipment you can make anywhere. Exclusive on reconditioned Cat-built machines, it is a bonded guarantee—up to \$10,000—of satisfactory machine performance and on *all* parts and labor during the guarantee period. Your Caterpillar Dealer, with his large selection of used equipment, also offers you two other types of protection—a "Certified Buy" and a "Buy and Try" deal on used units of any make.

Whether you're just beginning, middle size or a big contractor, you'll find as Philip Beauchamp did, you get your money's worth from your Caterpillar Dealer. He has a wide selection of reconditioned, classified and guaranteed trade-ins at fair, reasonable prices. He's interested in *your* needs and *your* problems and backs you with prompt service and parts you can trust. Don't buy "blind." See him—he's listed in the Yellow Pages.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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**BEST BUYS IN NEW
AND USED EQUIPMENT**

Enter 1065 on Reader Card

INDUSTRY NEWS

(Continued from page 55)

quarter. The authorization does not increase the total of \$2.9 billion available to the states in fiscal 1961, which began July 1. However, it doubles the \$718.4 million originally earmarked for the July-September quarter.

The action was expected to give a lift to highway construction activity and help the general economy. Highway spending in the January-May period of 1960 trailed the like period in 1959 by 13 percent.

Some figures were made available by Federal Highway Administrator B. T. Tallamy on the status of the interstate program as of March 31. It was one-fifth complete; furthermore, some form of work has been completed or was in progress on 23,644 miles—more than half the 41,000-mile total. Some 8,855 miles were open to the public; construction was under way on 4,353 miles more, and engineering or right-of-way acquisition was in progress on another 10,436 miles.

**Texas, California firms
tell of acquisitions**

THREE ROCK PRODUCTS industry firms have announced recent acquisitions. They include: Southern Pacific Milling Co., Ventura, Calif., Gifford-Hill & Co., Inc., Dallas, Texas, and Texas Industries, Inc., Dallas.

Southern Pacific Milling Co. has purchased Saugus Rock and Sand Co., Saugus, Calif., and Industrial Concrete of Van Nuys. This extends the company's operations into Los Angeles County. Said Philip E. Holmes, president of Southern Pacific Milling, "We anticipate these plants to increase our sales approximately \$2 million a year."

Gifford-Hill announced the purchase of Wichita Sand & Gravel Co., Wichita Falls, operator of two sand and gravel and three concrete batching plants. Tom C. Foley, Jack D. Foley and John J. Gavin, partners in Wichita Sand & Gravel before the purchase, will remain in their present capacities, said P. W. Gifford, president of Gifford-Hill.

Texas Industries acquired the plants and business of Circle Concrete Corp. and Irving Concrete Corp. to enter the ready-mix business in Dallas County. Acquisitions add substantial markets, said Ralph B. Rogers, president, for the company's heavy and lightweight aggregates and provide a market for its cement plant nearing completion at Midlothian, Texas.

(Continued on page 61)



Easily set up in field, Gardner-Denver G4 bit grinder operates on air power supplied by rotary portable compressor.

Save labor, cut rock faster with bits sharpened in the field

Sharp bits make hole faster, prolong bit life and drill steel life, and reduce rock drill maintenance. With Gardner-Denver bit grinders, using a small amount of air, you can sharpen spare bits in the field, while drilling progresses. You'll always have the bit you need—sharp and ready. There's no waiting or sending for fresh bits.

Choose from three models—There is a Gardner-Denver bit grinder for every size rock drill and "Mole-Drill"* bit:

G2—Lightweight, portable, air-powered grinder goes anywhere . . . can be mounted on "Air Trac"® drilling rig. Bench mounting reduces operator fatigue.

G4—Medium-size, bench-type, air-powered grinder . . . sets up quickly. Controlled grinding-wheel movement assures precision renewal of cutting surfaces and gauges.

G6—Heavy-duty, pedestal-type, air-powered grinder . . . this one grinds the big bits. Rugged construction provides stability. May also be used for smaller bits.

Get longer life and better drilling efficiency from your rock drill and "Mole-Drill" bits with Gardner-Denver bit grinders. Ask your Gardner-Denver specialist for details.

*Trade-Mark



EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

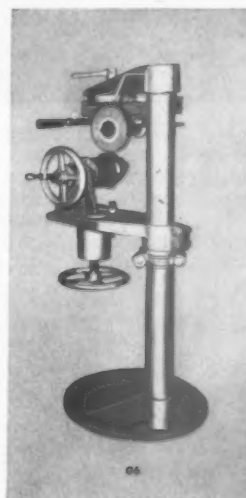
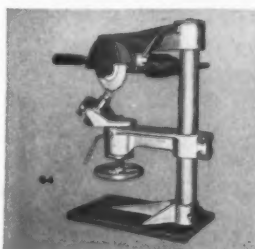
GARDNER - DENVER

Gardner-Denver Company, Quincy, Illinois

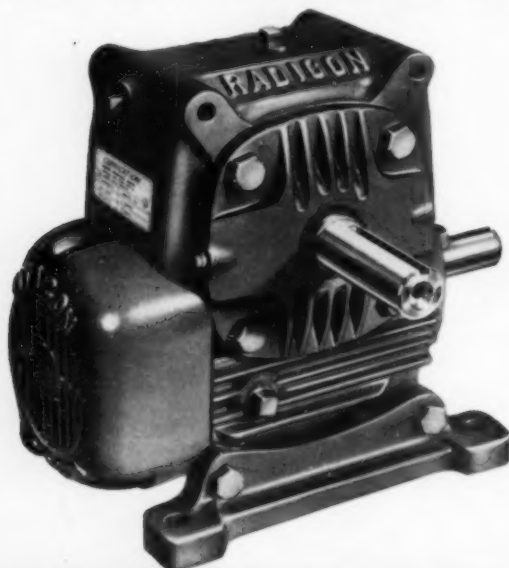
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

Enter 1009 on Reader Card

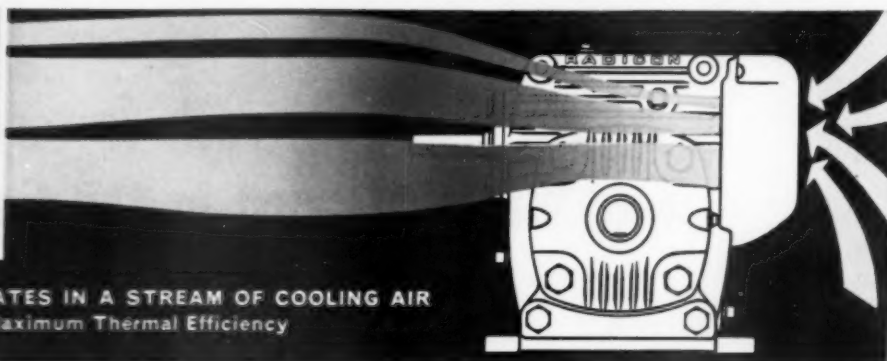
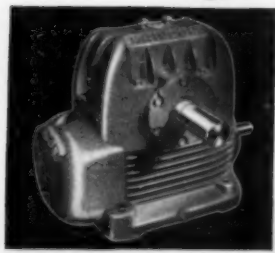
ROCK PRODUCTS, August, 1960



FOOTE BROS. introduces a COMPLETELY NEW line of **FAN-COOLED** WORM GEAR REDUCERS



- ▶ High load carrying capacity
- ▶ Rated to NEW AGMA Standards
- ▶ Automatic and Positive Lubrication
- ▶ 12 sizes—Center Distances from 1 1/4" to 8"
- ▶ Input ratings: .01 to 66 HP
- ▶ Output torque to 46,000 lb. in.
- ▶ Ratios from 5:1 to 70:1
- ▶ **IN STOCK FOR IMMEDIATE DELIVERY**



Foote Bros. RADICON Worm Gear Reducers incorporate *totally new* and advanced concepts of right angle speed reducer design. Precision gearing with super-finished threads and journals, rugged bearings and shafts, positive lubrication, and carefully controlled production techniques are combined in these compact RADICON Reducers to produce higher load carrying capacity and maximum service life.

Extremely efficient cooling is obtained by the maximum diameter fan forcing air at high velocity along

horizontal channels formed by the external ribbing of the housing. This dissipates radiated heat and holds the reducer's temperature rise to a minimum, permitting *identical* thermal and mechanical ratings, in most cases.

RADICON Fan-Cooled Worm Gear Reducers are available **FROM STOCK**. See them soon, at your nearby Authorized Foote Bros. Distributor. Get complete details on the performance, versatility, and service life they will bring you. Write for Radicon Catalog.

FOOTE BROS.



GEAR AND MACHINE CORPORATION

4589 South Western Boulevard, Chicago 9, Illinois

POWER TRANSMISSION DRIVES

UNLIMITED MOUNTING POSITIONS



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INDUSTRY NEWS

(Continued from page 58)

New rock plant in the Maritimes

THE RECENTLY FORMED Maritime Rock Products Ltd. has set up an unusual rock crushing plant near Antigonish, N.S. It will ship rock by boat to Prince Edward Island, New Brunswick and Nova Scotia. The company mines rock near the top of a small mountain located on tide water. The rock moves by gravity to the crushing plant from which it is conveyor-loaded onto ships for economical water transportation to the market area.

Beginning crushing operations in April, the company expects to produce 300,000 tons of rock this year, reports The Financial Post. President of the company is B. R. L. Matchett; vice president, Edward D. Maher, and secretary-treasurer, Dr. W. E. Hales. John P. Gray is a director. All are from the Fredericton area.

What's coming in September

Statistics can be more than an exercise in arithmetic to the aggressive aggregates producer. Even the simplest statistics can be a keen, powerful tool to increase a manager's understanding of his business. The September issue will carry Joseph Bell's explanation of statistics as a way of improving efficiency for the rock producer.

Report lists areas needing highway research

"HIGHWAY RESEARCH IN THE UNITED STATES—Needs, Expenditures and Applications 1959"—is the title of Special Report 55 of Highway Research Board, a unit of National Academy of Sciences-National Research Council. The report recommends an expanded national program of highway research, extending over the next 4 or 5 years and requiring about \$34 million.

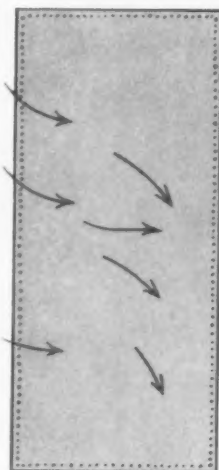
The 119-page publication lists 19 broad areas of research where accelerated studies are needed, leading off with aggregates and soils. The committee recommends that \$10 million be spent to further research in this field.

Current expenditures for highway research are estimated at \$17.8 million annually by all agencies (excluding

(Continued on page 64)

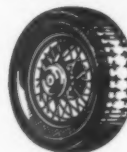
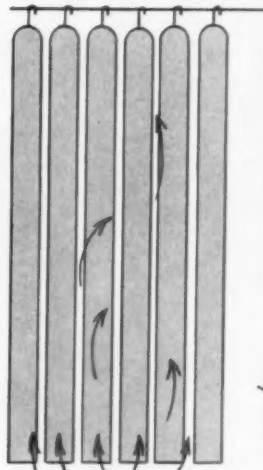


SLY DUST FILTERS For LONG BAG LIFE



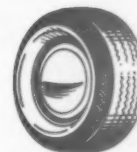
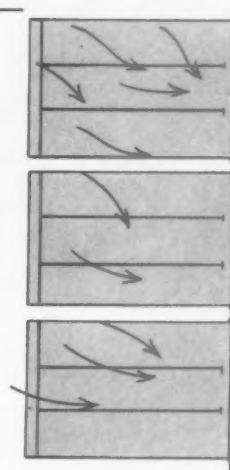
1900's
**SLY DUST
ARRESTER**

Cloth screens on wood frames were rigidly fastened to the dust arrester case, causing strain and excessive wear.



1930's
**SLY TUBE-TYPE
FILTER**

Certain areas of cloth tubes, particularly around the cuffs, bore the brunt of incoming dust-laden air, leading to premature failure. Shaking device also contributed to wear.



**TODAY
NEW SLY
"ROLL-CLEAN"
DYNACLONE®**

"Resist-O-Wear" filter bags have 3-section design for greater strength. Spacer weight is distributed on 3 seams. Bags are cleaned by reverse air.

New Dynaclone Filter Bags Provide 2 to 3 Times Longer Life

New SLY "Resist-O-Wear" bags (patent pending) far outlast other types, as proved on the most demanding applications. In addition to basic bag strength, Dynaclone construction and low-velocity design insures even distribution of dust-laden air over the entire cloth area . . . there is no dust concentration at certain points. Dust is removed automatically by reverse cleaning air—no shaking, no abrasion.

The Dynaclone operates continuously, 24 hours a day if required. Uniform, constant suction at dust sources results in complete dust collection.

SLY Dust Filters provide 20 to 40% more cloth in a given space than any other type. Space saved means lower installation costs, simplified piping and ductwork.

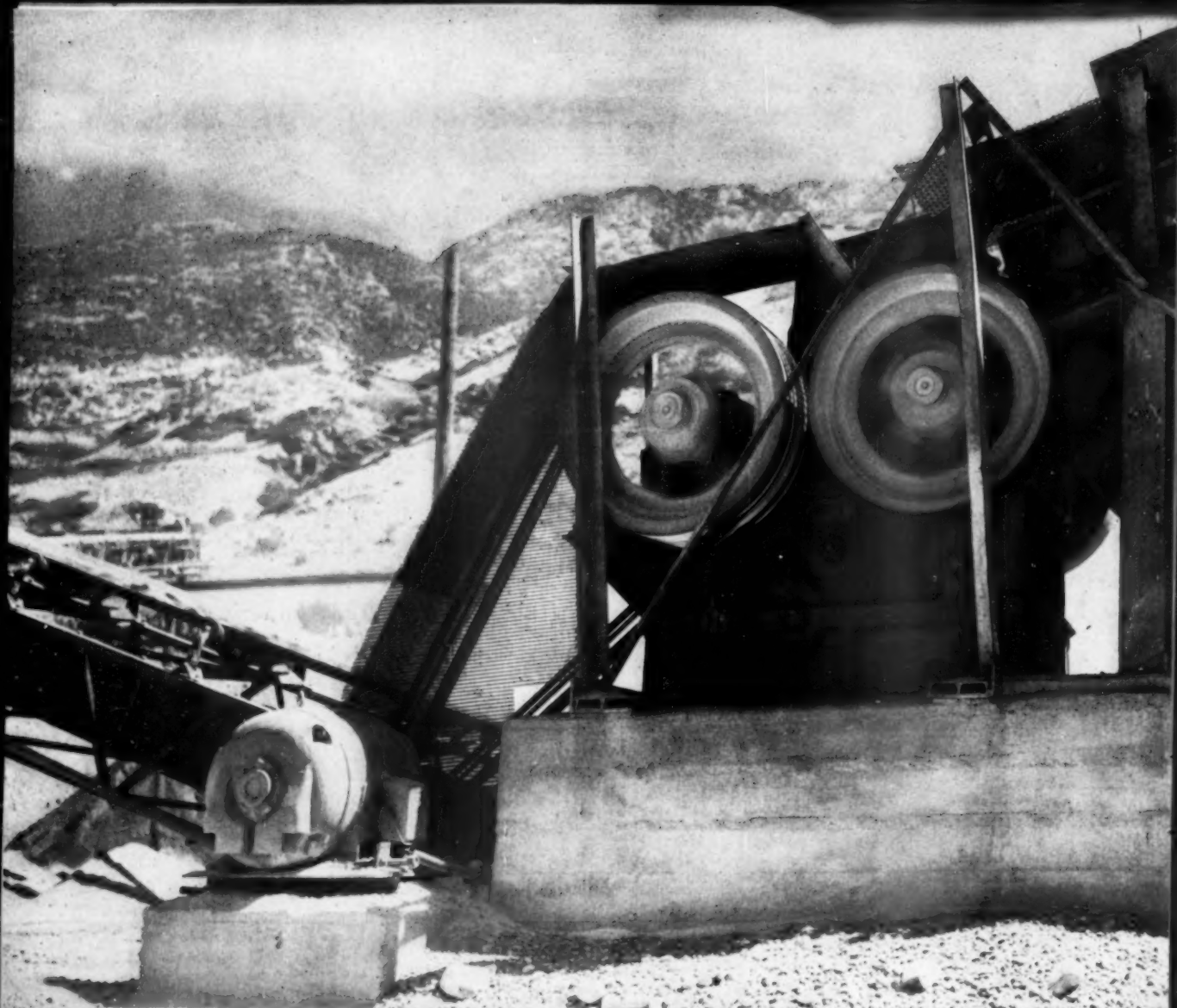
There are more than 40,000 SLY Dust Filters in use, including over 1,000 Dynaclones. Investigate their advantages on your applications . . .

SEND FOR 36-PAGE CATALOG 104

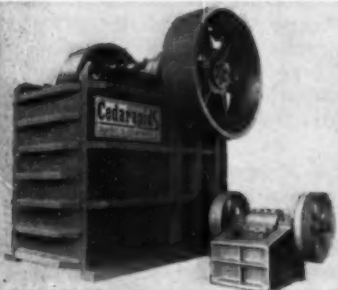
THE W. W. SLY MANUFACTURING CO.

4746 Train Avenue • Cleveland 1, Ohio • Offices in Principal Cities • Overseas Licensee:
Andrew Air Conditioning Ltd., London S. W. 1, England

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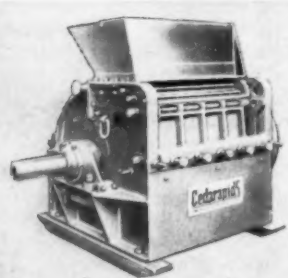
YOU'RE MONEY AHEAD with every job-proved, high capacity crusher in the



Single Jaw Crushers available in a complete range of 13 sizes, ranging from the big-producing 42" x 48" to the 10" x 16" size in the roller bearing type. Plain bearing single jaw crushers range from 9" x 16" to 10" x 36". Three sizes of Twin Jaw Crushers, from 12" x 16" to 18" x 36", available for stationary installations or in portable plants. Low maintenance cuts costs.

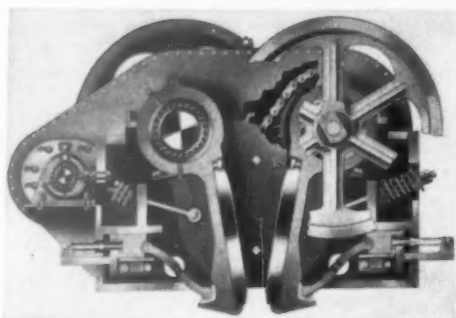


Six models of Double Impeller Impact Breakers include sizes from 22" x 22" to 53" x 60" to meet volume requirements up to 1000 tons per hour. Counter-rotating impellers, an exclusive Cedarapids design, permit breaking rock with rock to utilize the entire breaking chamber, thus saving manganese wear and reducing maintenance. Two sizes of Single Impeller Impact Breakers also available for intermediate reduction to increase plant capacity.



Exclusive Cedarapids Hammermill features give the material a combined impact breaking and milling action that produces big volumes of uniform cubical shaped aggregate without slabs or slivers, as well as high quality ag-lime, and turn out more tons per hour than other similar types of equipment. Four sizes, from 20" x 33" to 50" x 40",

Extra Output . . . Extra Profits . . . for 14 years with CEDARAPIDS TWIN JAW CRUSHERS



**DESIGNED WITH THE SAME
CEDARAPIDS JAW CRUSHER
FEATURES THAT SET THE STANDARD FOR
THE INDUSTRY**

- Eccentric shaft extra heavy to absorb strain and minimize shaft flexure
- Adjustable-tension timing chain drive prevents trouble due to possible shaft flexure. No fine-cut timing gear that requires critical alignment
- Heavier-than-average self-aligning pitman and side bearings absorb side thrust
- Reinforced, electric-welded crusher bases are completely stress-relieved for longer life
- Extra heavy flywheels insure smooth operation under surge feeding with minimum power

Complete Cedarapids Line



Where high capacities of small sized aggregates are required, Cedarapids Roll Crushers are the best units for secondary reduction. Material is dropped between the rolls to penetrate deep into the crushing area and permit faster feeding. Special feed box with angle divider spreads material across the full width of the rolls to prevent uneven wear on the roll shells. Six sizes, from 16" x 16" to 55" x 30", meet volume demands.

The first Cedarapids Twin Jaw Crusher was built in 1946. In the 14 years since, aggregate producers have enjoyed the extra profits that come from the Twin Jaw's ability to step up primary crushing capacity 40% to 100% over single jaw units of comparable size.

In addition to tremendous hourly tonnages that increase overall plant production, owners of Cedarapids-developed Twin Jaw Crushers get these other benefits which assure lowest cost per ton:—

Versatility to handle many types of material, including hard or abrasive rock.

A greater percent of aggregate fractured in the primary operation (much of it crushed to finished size by the Twin Jaw) to reduce the circulating load and save wear on secondary crushers.

Extremely low maintenance, plus jaw life 5 to 8 times longer than with single jaw crushers, due to the Cedarapids design that minimizes abrasive rubbing under pressure.

There are dozens of other benefits, developed as a result of Cedarapids 14 years' experience in designing, building, and continually improving Cedarapids Twin Jaw Crushers to give you the trouble-free dependability and profitable performance that has been thoroughly proved in the field. It will pay you to send the coupon for full details. Or see your near-by Cedarapids Dealer. He can help you determine which type of crusher in the complete Cedarapids line will best suit your specific needs.

IOWA

MANUFACTURING COMPANY

Cedar Rapids, Iowa



Gentlemen: I need higher crushing capacity with lower cost. Please send the Bulletins checked below.

- | | |
|--|--|
| <input type="checkbox"/> Twin Jaw Crushers | <input type="checkbox"/> Single Impeller Impact Breakers |
| <input type="checkbox"/> Single Jaw Crushers | <input type="checkbox"/> Roll Crushers |
| <input type="checkbox"/> Double Impeller Impact Breakers | <input type="checkbox"/> Hammermills |

Name.....

Company.....

Address.....

City.....State.....

S960N

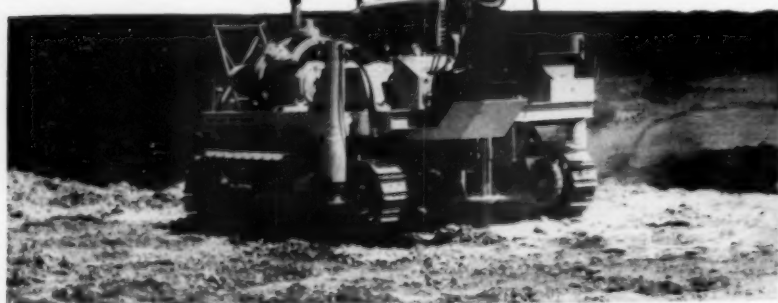
Drill Blast Holes 2 to 5 Times Faster...

The BLASTHOLER, a self-propelled rotary drill, is mounted on tracks or dual pneumatic tires. It covers the ground like a bulldozer. Only one operator is required, and the BLASTHOLER carries its own air for cleaning blast hole. In limestone quarries meeting highway specifications, the BLASTHOLER can drill 20' holes in an average of 3 to 4 minutes. Many BLASTHOLERS have drilled more than a million feet within a 2-year period. The BLASTHOLER can improve your production record and save you money, too. Contact your nearest dealer for a cost-cutting demonstration today!

•
**ONE
OPERATOR**

•
**ONE
MACHINE**

BLASTHOLER drilling 25' blast holes 3" in diameter in limestone quarry. Production averages 1200' per day.



BLASTHOLER

DEALERS

The W. W. Williams Co.
Columbus, Ohio
Reid-Holcomb Co., Inc.
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Watson Equipment Co., Inc.
Pittsburgh, Pa.
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South Charleston, W. Va.

Illinois Road Equipment Co.
Springfield, Illinois
Williams Tractor Co.
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Hi-Way Machinery Co.
Dallas, Texas
Bublitz Machinery Co.
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James W. Bell Co., Inc.
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2006 South Industrial Boulevard Dallas, Texas

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INDUSTRY NEWS

(Continued from page 61)

related industrial research privately financed). The recommended program would increase annual research expenditures by about 38 percent.

The special committee was created by the executive committee of the Highway Research Board in June 1958 to "screen all available research data, set priorities and estimate costs to get a program of highway research into motion as quickly as possible."

Copies of the report are available for \$2.80 each from Highway Research Board, 2101 Constitution Avenue, N.W., Washington 25, D.C.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of May and the first five months of 1960 have been classified by Portland Cement Association as follows:

	Sq. yd. awarded during:	
	May	1st 5 mos.
Roads	6,202,423	26,111,687
Streets and alleys	3,451,652	11,103,635
Airports	308,637	2,350,427
Totals	9,962,712	39,566,039

Fry Coal & Stone joins American-Marietta

FRY COAL AND STONE CO., Mercersburg, Pa., will become a division of American-Marietta Co., Chicago, Ill. Two associated firms, Garbart Construction Co. and Vesco Corp., are included in the acquisition agreement. Fry has eight quarry and processing plants which supply concrete aggregates, road stone and bituminous aggregates for highway and road construction in Pennsylvania, Maryland and West Virginia. It also has a coal mining operation at Langdondale, Pa.

In keeping with American-Marietta's decentralized operations, management of Fry Coal and Stone Div. will continue under Leonard S. Fry, founder and president.

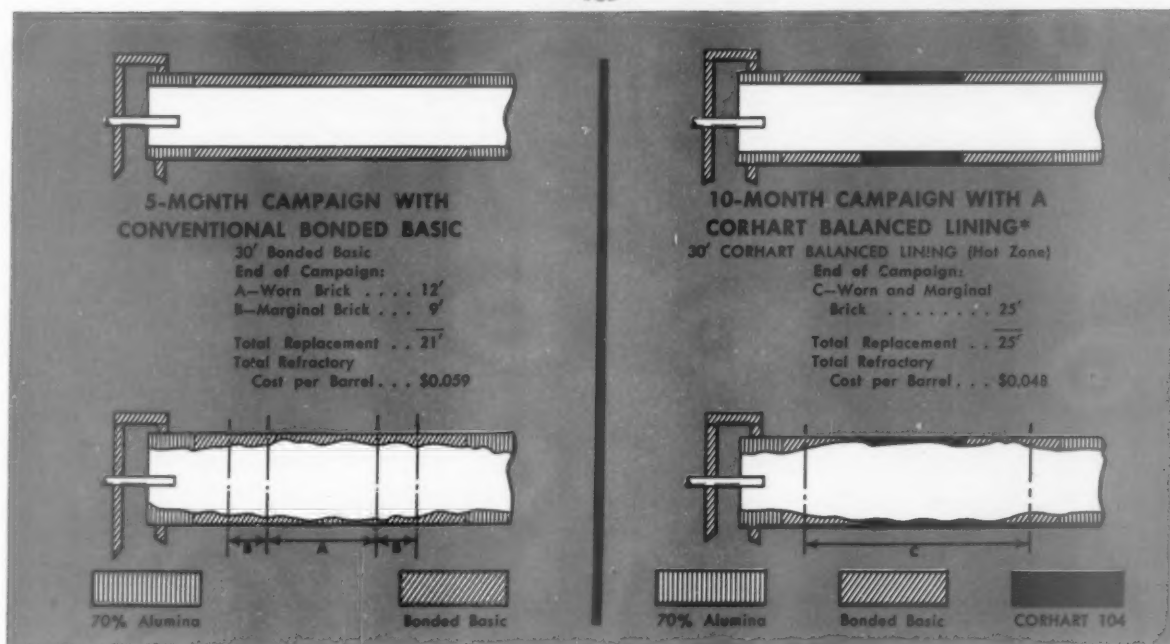
Permanente denies FTC antitrust charges

THE FEDERAL TRADE COMMISSION filed antitrust charges against Permanente Cement Co., Oakland, Calif., and its subsidiary in Seattle, Wash., Glacier Sand & Gravel Co. Perma-

(Continued on page 66)

CORHART PROVES IT

IN THE HOT SPOTS!



CORHART 104 BALANCED LININGS* eliminate "in-between" kiln repairs!

COSTLY "hot spots" in cement kiln hot zones often cause intermediate repair shutdowns between major refractory replacements.

These shutdowns excessively raise the cost of materials and manpower, and they put a stranglehold on your kiln's productivity.

But now there's a solution to "hot spot" wear! It's *Corhart 104*, the only high-density electrically-melted hot zone refractory. Modest amounts of this new **ELECTROCAST®** refractory in these troublesome wear areas will rub-out "hot spots" and balance refractory life throughout the hot zone. It outlasts other basic refractories at least 2-to-1 by providing much greater resistance to spalling and chemical attack. Surprisingly small amounts of **ELECTROCAST** refractory in a Corhart "BALANCED LINING" can economically increase kiln refractory life and permit better utilization of conventional refractories.

Corhart engineers are always available to assist in tailoring a Corhart 104 **BALANCED LINING**

to your kiln conditions. Send for your free copy of the full-color brochure illustrating the many advantages of Corhart 104 **BALANCED LININGS**. Corhart Refractories Company, Incorporated, 944 Commonwealth Building, Louisville 2, Kentucky. Phone—JUniper 5-4201.

*Trade Mark



CORHART REFRACTORIES COMPANY

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The words "Corhart", "ZAC", and "Electrocast" are registered trade marks which indicate manufacture by Corhart Refractories Company, Incorporated.

Experienced kiln operators insist on
RINGBLASTER and Western



THE DEPENDABLE, ECONOMICAL WAY TO SMASH KILN RINGS

Year after year industry's "first-team" for fast, low-cost "ring-smashing" in all kinds of rotary kilns has been Ringblaster and Western Industrial Shells. Constant research in the Winchester ballistics labs has led to many tested improvements. The latest is a scientifically impregnated slug jacket which insures maximum power by sealing extra force behind the slug. This new tightly-rolled paper jacket is now standard on the Super-X and low-velocity lead slug shells. It is designed to eliminate even the slightest fragmentation of the lead slug, and reduces Kiln Gun maintenance problems to the lowest possible level.

With improved Western shells, Ringblaster is an even better choice for accurate ring smashing with a minimum of time, trouble and expense. Requiring fewer shots to do the job, Ringblaster cuts kiln down-time to a new low... makes any kiln operation more efficient. Write for details today.

RINGBLASTER KILN GUN *another product by* **Ramset® Fastening System**

OLIN MATHIESON  WINCHESTER-WESTERN DIVISION
 Chemical Corporation  304-H Winchester Ave. • New Haven 4, Conn.

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INDUSTRY NEWS

(Continued from page 64)

nente, an affiliate of Kaiser Industries Corp., was accused of making acquisitions that might reduce competition or tend to create a monopoly. Denying the charges, a Permanente spokesman was quoted by The Wall Street Journal as saying the complaint will be vigorously defended.

Specifically, the FTC complaint challenged Permanente's acquisition in 1958 of 98 percent of Olympic Portland Cement Co., as well as the acquisition a year later by Glacier Sand & Gravel Co. of Pacific Building Materials Co. and Ready Mix Concrete Co., both of Portland, Ore.

Permanente's purchase of Olympic, alleged the FTC, may "inhibit or prevent" the entry of new companies into the cement supply business and may cause a substantial reduction in the amount of cement available in the western Washington area. The commission also charged that Glacier Sand's takeover of the two Portland companies may tend to reduce competition from producers of concrete, sand and gravel who are not affiliated with a cement manufacturer.

Federal-aid highway costs remained stable—ARBA

AMERICAN ROAD BUILDERS ASSOCIATION has tabulated construction costs of the Federal-Aid highway program and concluded, "As measured by an index of average bid prices compiled by the Bureau of Public Roads from state reports... costs have remained remarkably stable over the past two years." There was a 2.4-percent drop in costs in the last quarter of 1959 from the final quarter of 1958.

Period	Price index*	
	1959	1958
1st quarter	140.8	140.4
2nd quarter	137.1	141.6
3rd quarter	137.3	139.2
4th quarter	138.4	141.6

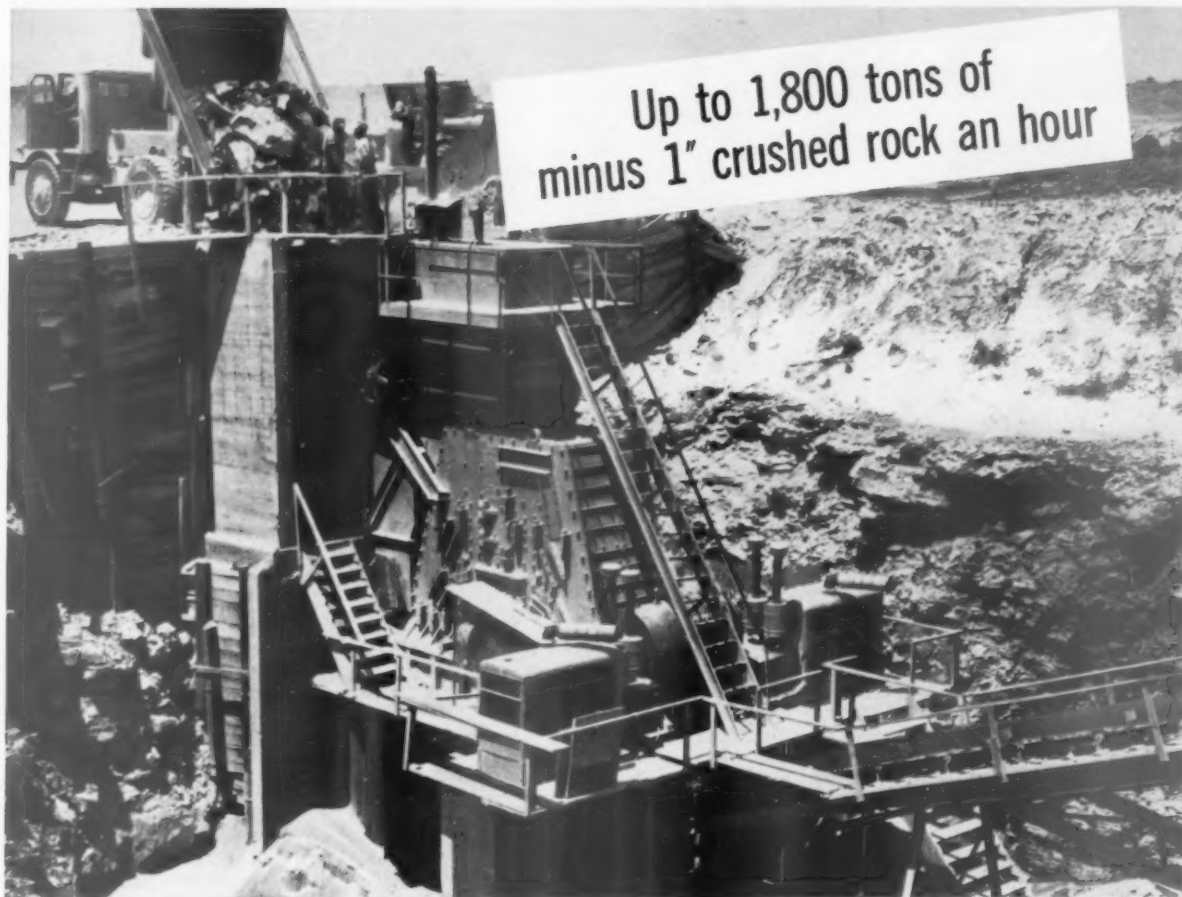
*Price index: 1946=100.

Pittsburgh Coke & Chemical forms Green Bag Cement Co.

GREEN BAG CEMENT CO. has been formed as a wholly owned subsidiary of Pittsburgh Coke & Chemical Co. The move was explained by Robert M. Moore, vice president of Pittsburgh Coke's Cement and Concrete Products Group. He said it was made to focus attention of management

(Continued on page 68)

GET REAL PRODUCTIVITY—GET A GM DIESEL



PROBLEM: Providing over two million tons of road-base material without benefit of a natural gravel deposit or local electric power.

SOLUTION, as applied by Iowa's E. F. Schildberg Construction Company: Good planning, imaginative engineering and GM Diesel Power!

RESULT: High standard of productivity in completing a 33-mile stretch of super-highway west of Des Moines in 7½ months!

Schildberg Construction Company knew it was tackling a tough contract. The company set up its own, highly flexible quarrying and rock-crushing operation in a deposit of hard limestone near the project, and put 32 GM Diesels to work in scrapers and earth-moving trucks...

in pug mills, impactors and portable rock-crushers, and in generator sets to power a complex of conveyors. In high gear, this efficient plant turned out as much as 1,800 tons of minus 1" crushed road-base rock an hour!

"We're mighty proud of our production record," says owner E. F. Schildberg. "We kept 'Jimmy' Diesels working at peak load, and, even under extremely dusty quarry conditions, they required very little upkeep. We're pretty strong 'Jimmy' Diesel boosters... without the dependable GM Diesel engine, we would never have set the production standard we did."

Whatever you use power for—trucks, crushers, compressors, shovels, or any other quarrying job—you'll find a GM

Diesel will speed your work and save you money. Your GM Diesel distributor can prove it. Call him—he's in the Yellow Pages under "Engines, Diesel"—or write direct for more information.



GM DIESEL

DETROIT DIESEL ENGINE DIVISION,
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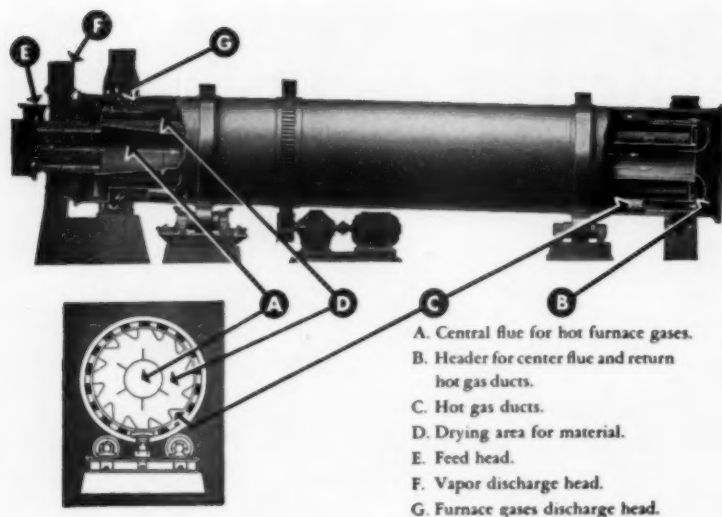
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario
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GM DIESEL ALL-PURPOSE POWER LINE

sets the standard of
Diesel productivity

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ROCK PRODUCTS, August, 1960



Ruggles-Coles **INDIRECT-FIRED DRYERS and HEATERS**

- Dry without contamination from combustion gases, regardless of fuel.
- Minimize auxiliary dust collection when handling fine precipitates and filter cake.
- Heat pulverized materials for process work.
- Collect vapors at high concentration.
- Available fabricated with heat and corrosion-resistant metals.

104" diameter by 65' long Ruggles-Coles Indirect Dryer removing moisture from washed and filtered Kaolin clay at Gardner, Ga., plant of Mineral and Chemical Corporation of America, Edgar Division.



Write for complete specifications. Ask for Bulletin AH-438-7

HARDINGE
COMPANY, INCORPORATED

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"Hardinge Equipment—Built Better to Last Longer."

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INDUSTRY NEWS

(Continued from page 66)

more sharply on the needs of its cement markets than was possible when Green Bag operated as a division of the widely diversified parent company.

Pittsburgh Coke is now formed of three subsidiaries and one division: Pittsburgh Chemical Co., Green Bag Cement Co., United States Concrete Pipe Co. and the Coke & Iron Division.

United States Concrete Pipe Co. will continue under Samuel O. McFall, chairman and president. Louis R. Forbrich is vice president and general manager of Green Bag Cement. Mr. Moore, as vice president of Pittsburgh Coke's Cement and Concrete Products Group, oversees operations of both U. S. Concrete Pipe and Green Bag Cement, and serves as president of the latter.

Shareholders were told at Pittsburgh Coke's annual meeting that Green Bag Cement Co.'s distribution terminal is operating at Marietta, Ohio, and another is planned for Fairmont, W. Va.

Construction under way for Utah phosphate plant

SAN FRANCISCO CHEMICAL CO., Montpelier, Idaho, began construction in April of a phosphate plant near Vernal, Utah. The first of six crushing and beneficiation units is expected to be completed by October 15, said D. L. King, general manager of the Idaho operations. The crushing plant will grind and dry ore at a rate of 250 tph. Equipment is being installed by Western-Knapp Engineering Co.

From Vernal the ore will be transported by truck to Garfield, Utah, where a Western Phosphates, Inc., plant will process the concentrates in production of wet-process phosphoric acid, triple superphosphate and ammonium phosphates.

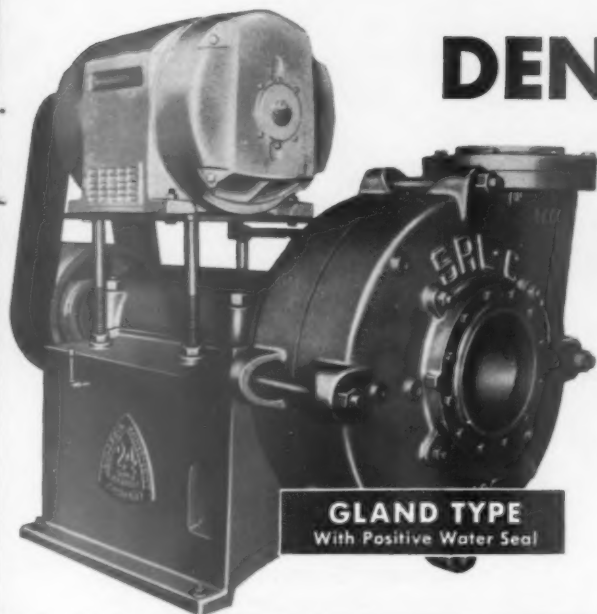
Eastern Kentucky to get new silica plant

CONSTRUCTION HAS BEGUN ON A \$1.5-million silica processing plant near Elkhorn City, Ky. Silica Corp. of America (Silcoa) will take the stone from an extensive deposit lying on the crest of Pine Mountain at the Kentucky-Virginia border. Lease and purchase holdings cover 35,000 acres.

Stone blasted from the escarpment will travel 2,700 ft. by conveyor belt

(Continued on page 70)

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GLAND TYPE
With Positive Water Seal

DENVER SRL PUMPS

Now available in
TWO Models

FOR AN EVEN
WIDER RANGE OF
PUMPING APPLICATIONS



GLANDLESS TYPE
No Gland—No Sealing Water

AVAILABLE IN THESE SIZES AND CAPACITIES

Specifications and Dimensions

Pump Size and Type	Capacity 60' Head		*Water GPM	Dimensions (in.)			Approx. Ship. Wt. Lbs.
	RPM	HP		L	W	H	
GLAND TYPE							
1½"x1½"	2190	1.9	40	25	17½	26	525
2½"x2"	1500	4.9	160	25½	17½	26½	575
3" x3"	1400	6.8	260	31½	19½	31½	850
5" x5"	1050	17.4	800	37½	26½	36½	1550
6" x6"	1170	36.3	1600	45½	28½	46½	2300
3" x3"—C	1450	8.2	260	37½	21½	33½	1240
3" x4"—C	1035	12.6	700	40½	27	37½	1600
8" x6"—C	920	39.8	1600	63	36½	49½	4375
10" x8"—C	820	74.0	3300	68½	43	57	5100
12" x10"—C	615	115.0	5000	69½	46½	63	5900
GLANDLESS TYPE							
3" x3"—C	1450	10.0	180	37½	21½	33½	1240
3" x4"—C	1035	15.0	500	40½	27	37½	1600
8" x6"—C	920	47.0	1200	63	36½	49½	4375
10" x8"—C	820	87.0	2700	68½	43	57	5100

*Based on water. Multiply horsepower by specific gravity of pulp to obtain actual brake horsepower.

DENVER "TRU-GLANDLESS" SRL PUMP... A MAJOR ADVANCE IN PUMP DESIGN

DENVER SRL Pumps with positive water seal already have a world-wide reputation for their high efficiency, low part cost, long life. If dilution of pulp or slurry is a problem, you now get the extra advantage of "TRU-GLANDLESS" construction. Requires no sealing water, no packing glands, eliminates pulp dilution.

No Packing
Gland
No Sealing
Water
No Pulp
Dilution

SEND DETAILS OF YOUR PUMPING PROBLEMS TO DENVER

Complete Mineral Processing Equipment

"The firm that makes its friends happier, healthier and wealthier"



JAW CRUSHER



STEEL HEAD MILLS



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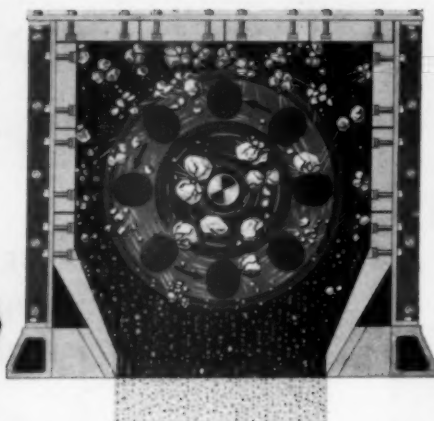
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Casilla 4930 • Phone 41887

SIZE AND UPGRADE

YOUR AGGREGATES
FOR BOTH CONCRETE
AND BITUMINOUS
MIX WITH

STEDMAN CAGE MILL



The Stedman Single-Cage Mill reduces Gravel and Stone, either wet or dry, via the Internal-Impact Principle. See cut above. It pulverizes unsound material to be passed off with fines—the discharged product going to wet screens, log washer, jig, or heavy media process.

The Stedman Single-Cage Mill not only upgrades your product, but also gives the greatest percent of crushed surfaces for

Black Top Mix. Example: "Crush your—2" + 1/4" including pea gravel to a product of 3/4" X O, screen out minus 3/4" sand and furnish a specification product for Bituminous Mix with 65 to 100% crushed particles."

Variation of speeds and type of cage result in a wide variety of product sizes. Wire or write for information.

STEDMAN FOUNDRY AND MACHINE COMPANY, INC.
Subsidiary of United Engineering and Foundry Company
AURORA, INDIANA, U. S. A.

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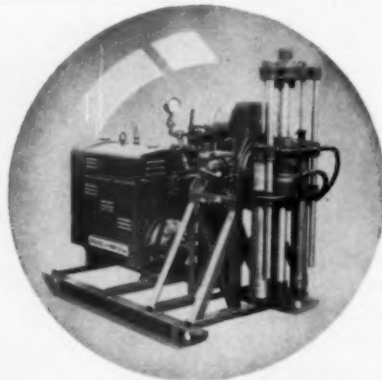


MODEL

30

CORE DRILL MACHINE

- LIGHT
- COMPACT
- PORTABLE
- VERSATILE



- The ideal machine for foundation investigation and shallow mineral exploration.
- Available with either screwfeed or hydraulic swivel-heads with or without built-in water pump and a wide choice of power units.
- Unit can be skid, truck, or trailer mounted.
- The Model 30 is a quality machine produced by a quality manufacturer.

Look for our emblem... It's your Seal of Quality

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.



MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.

New York—Philadelphia—Nashville—Pittsburgh—Grand Junction, Colo.—Buchans, Nfld.
Export Division: Sprague & Henwood International Corporation, 11 W. 42nd St., New York, N.Y.

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INDUSTRY NEWS

(Continued from page 68)

as it drops nearly 1,000 ft. to the plant. Another 2,700 ft. of belt will take it through crushing, washing, separation and drying operations. Sizes will range from 1 1/2 in. to fines, and daily production will average 2,000 tons.

Silcoa is headed by Thomas C. Carson of Kingsport, Tenn. He is noted for his contribution to the flotation method of silica separation, and formerly was associated with International Minerals and Chemical Corp. and the Blue Ridge Glass Division of American Saint-Gobain Corp.

National Gypsum to acquire Allentown

NATIONAL GYPSUM Co., Buffalo, N.Y., plans to acquire Allentown Portland Cement Co., Allentown, Pa., through an exchange of stock. The exchange will involve 584,289 shares of National Gypsum's common stock for the outstanding shares of Allentown's common stock, on the basis of .505112 of a share of National Gypsum for each share of Allentown.

A registration statement was filed with the Securities and Exchange Commission covering the proposed acquisition. Following clearance by the SEC, the formal offer to Allentown's stockholders is expected to be made this month.

Allentown has plants at Evansville and West Conshohocken, Pa., with combined annual capacity of 4.5 million bbl. A 12-million-bbl. producer, Huron Portland Cement Co., was acquired by National Gypsum in 1959.

Ships first carload of marble chips

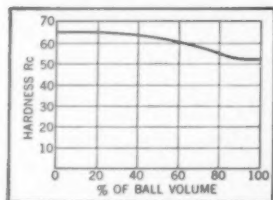
DEZENDORF MARBLE Co., whose Burnet, Texas, plant is now in operation, announced that the plant shipped its first carload of marble chips in June. Present capacity is about 100 tpd. Suppliers of terrazzo to nationwide markets, the company has four other plants, three in Austin and one in Llano, Texas. S. C. Bilbrough of Austin is president.

The Burnet plant is located on the Southern Pacific Railroad. Several ranches in the vicinity have been purchased which have marble deposits in a variety of colors. The plant now has 12 colors in production.

(Continued on page 72)



Immediate delivery on USS Grinding Balls We can ship immediately from stock as requested a range of sizes from $\frac{3}{4}$ " to 4" in USS Carbon-Manganese and USS Alloy Steels. Here are three reasons why USS Grinding Balls should be specified: **Maximum hardness** combined with superior toughness. **Deeper hardness penetration** achieved by careful combination of chemical composition and heat treatment. **Uniform roundness** from ball to ball, load to load, for less wear and superior performance. If you have a delivery, performance, or selection problem, call our nearest Sales Office or United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.



USS is a registered trademark

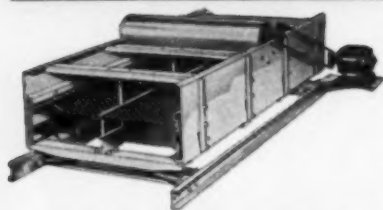


This mark tells you a product is made of modern Steel.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company
United States Steel



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Racine, Wisconsin
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Insist on
**INDIAN BRAND
MANGANESE STEEL**



**Shovel Dippers • Dipper Teeth
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Mantles • Concaves
Bowl Liners • Roll Shells
Pulverizer Hammers
Grate Bars • Breaker Plates
Ball Mill Liners • Screen Plates
Misc. Manganese Steel Castings**

**THE FROG, SWITCH AND
MANUFACTURING COMPANY**
Corlisle, Pennsylvania • Established 1881

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INDUSTRY NEWS

(Continued from page 70)

D & B publishes new cost control booklet

DUN & BRADSTREET has published a booklet, "How to Build Profits by Controlling Costs." It is written from the point of view of the small businessman. Examining common business problems, it includes many suggestions

for controlling costs and a step-by-step examination of record keeping, analysis of figures and use of ratios. Copies are available for \$1 each from P.O. Box 803, Church Street Station, New York 8, N.Y.

Sand, gravel production up 8 percent in 1959

AN INDUSTRY-WIDE SURVEY to measure the contribution of the sand and gravel industry to the national economy has been completed by National Sand and Gravel Association. Some of its major findings: sand and gravel production increased 8 percent in 1959; valuation increased 12 percent, and average value per ton increased 4 percent. Specifically, 289,323,746 tons were produced; valuation was \$337,753,085, and price per ton was \$1.17.

This is the seventh annual survey conducted by the Association. In making his report, Kenneth E. Tobin, Jr., associate managing director, said 871 companies participated in the survey. They operate 1,364 plants, or 41 percent of the total number of companies to whom the questionnaire was sent. "We believe the reporting companies produced a majority of the total commercial sand and gravel tonnage in 1959," he remarked.

Table 1: Sand and gravel in 1957, 1958 and 1959

	1957	1958	1959
Production:			
Sand (tons)	97,170,144	119,989,477	131,302,339
Gravel (tons)	119,202,394	147,818,325	158,021,507
Total (tons)	216,462,438	267,808,002	289,323,746
Value:			
Sand	\$ 97,678,911	\$123,203,844	\$141,806,418
Gravel	141,102,771	179,714,285	195,946,667
Total	238,781,682	302,918,129	337,753,085
Average value per ton:			
Sand	\$1.01	\$1.03	\$1.08
Gravel	1.18	1.32	1.24
Total	1.10	1.13	1.17
Companies surveyed	1,463	2,058	2,120
Companies reporting	604	844	871
Number of plants operated by reporting companies	1,063	1,377	1,364
Average production per reporting company (tons)	358,382	317,308	332,174
Average production per reporting plant (tons)	203,634	194,487	212,114

1959 totals include 55 member companies not actually replying to the questionnaire but whose production of 23,082,326 tons of sand and gravel was otherwise available.

Six tables accompany the report. Table 1 provides production figures for 1957, 1958 and 1959; Table 2 analyzes methods of transportation; Table 3 summarizes consumption; Table 4 is a compilation, by states, of production, value and transportation data; Table 5, a compilation, by states, of consumption (seven types of consumers are listed); and Table 6 analyzes distribution of production, according to size of the company.

Table 2: Methods of transportation of sand and gravel in 1958 and 1959

Type of transportation	1958		1959	
	Short tons	Percent of total	Short tons	Percent of total
Truck	181,543,490	73.1	187,294,092	70.3
Rail	42,335,436	17.0	44,074,819	16.6
Water	15,284,010	6.2	26,573,289	10.0
Unspecified	9,304,479	3.7	8,299,220	3.1
Total	248,367,414	100.0	266,241,420	100.0

Table 3: Consumption of sand and gravel in 1959

Type of Consumer	1958		1959	
	Short tons	Percent of total	Short tons	Percent of total
Construction (buildings, highways, streets, etc.)	111,775,954*	45.0	113,799,912	42.7
Ready-mixed concrete	78,154,698	31.5	88,045,347	33.1
Concrete products	11,657,266	4.7	12,723,034	4.8
Railroad ballast:				
(1) Prepared				
(a) Less than 40 percent crushed	1,603,884	0.6	1,358,245	0.5
(b) More than 40 percent crushed	1,218,034	0.5	1,094,650	0.4
(2) Unprepared (bank run)	1,536,717*	0.6	2,089,294	0.8
Sold through dealers	21,602,551	8.8	21,607,598	8.1
Other	10,307,591	4.1	8,826,124	3.3
Unspecified	10,309,609	4.3	16,697,216	6.3
Total	248,367,414	100.0	266,241,420	100.0

*Revised

END

Pre-Engineering by **KAISER ENGINEERS** answers basic plant expansion questions...



Raw Materials?

Your final decision to expand or build results from a series of important individual decisions. Raw material availability is one of them. Independent analysis of all aspects of your proposed program is the *Pre-Engineering* service offered by Kaiser Engineers. In addition, KE is an experienced designer and builder of all types of facilities for the Minerals industry. From Pre-Engineering through design and construction Kaiser Engineers provides complete one-company service and ingenuity based on years of experience.



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Need specification aggregate?

4 low-cost ways to produce it, on location!



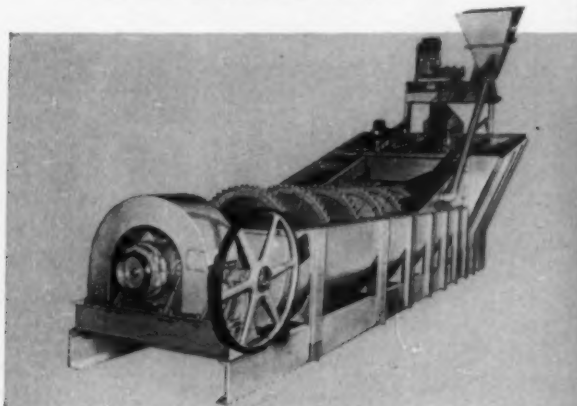
1 Grinding with Marcy CPD Rod Mills

Grinding stone or waste pea gravel in a Marcy Mill results in a superior, cubical product for blending to meet the most rigid specifications. Marcys have kept many small operators in business; and, have been used on almost all large government dam jobs.



2 Washing and Classifying with Akins Classifiers

With the Akins Classifier you can wash, deslime, dewater, and remove or save sand sizes as desired. A large working pool area in classifier is required to do this work...the Akins gives you more working pool area per dollar.



3 Separating with Akins Heavy Media Separators

Many deposits can be most efficiently treated by the Akins heavy media process. The Akins' large working pool area permits close control of products from feed of variable quality or quantity. Reduced media recirculation in the Akins results in lower total horsepower required.



4 Scrubbing with Marcy Heavy-Duty Scrubbers

Thorough, efficient removal of clay from sand can be accomplished with Marcy Scrubbers. The Marcy principle of small diameter, long length scrubbers gives longer retention time, more contact for scrubbing, less short-circuiting, and lower horsepower...a principle which has been proven on difficult washing of iron ore.

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to give you
the best!*

Manufacturing Division

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and in principal cities of the United States.

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CALENDAR

OF COMING EVENTS

1960

October 3-6, 1960—National Sand & Gravel Association, Semi-Annual Meeting, Board of Directors, Del Monte Lodge, Pebble Beach, Calif.

October 10-13, 1960—American Mining Congress, 1960 Metal Mining and Industrial Minerals Convention and Exposition, Las Vegas, Nev.

October 13-15, 1960—Empire State Sand, Gravel & Ready Mix Association, Fall Conference, Hotel Syracuse Country House, Syracuse, N.Y.

October 17-19, 1960—Biannual Symposium on Drilling and Blasting, Colorado School of Mines, Golden, Colo.

October 18-19, 1960—Cement, Quarry & Mineral Aggregates Section, National Safety Congress, Conrad Hilton Hotel, Chicago, Ill.

November 3-4, 1960—National Slag Association, Annual Meeting, Hotel Mayflower, Washington, D.C.

1961

January 17-19, 1961—National Limestone Institute Inc., 16th Annual Convention, Statler-Hilton Hotel, Washington, D.C.

January 17-20, 1961—National Crushed Stone Association, Annual Convention, Hotel Americana, Bal Harbour, Fla.

January 23-26, 1961—National Sand & Gravel Association, Annual Convention, Hotel Americana, Bal Harbour, Fla.

Jan. 29-Feb. 3, 1961—American Society for Testing Materials, Committee Week, Netherland Hilton Hotel, Cincinnati, Ohio

March 5-8, 1961—American Road Builders Association, 59th Annual Convention, Atlantic City, N.J.

April 12-14, 1961—American Institute of Mining, Metallurgical & Petroleum Engineers, International Symposium on Agglomeration, Sheraton Hotel, Philadelphia, Pa.

April 18-20, 1961—American Institute of Electrical Engineers, Cement Industry Technical Conference, The Sheraton-Cadillac, Detroit, Mich.

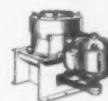
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that cares enough
to give you
the best!*

Laboratory Equipment



**4"x 6" Massco
Laboratory Jaw
Crusher**

Welded steel frame; manganese steel jaw and cheek plates; bronze bushed bearings; smooth jaws give better product and easier cleaning. Adjust for plate wear and product size by convenient hand wheel adjustment.



**6" and 10" Massco
Gy-Roll Reduction
Crusher**

Reduces 1/2" feed to as fine as 10 mesh in single pass. High capacity, low power consumption.



**Laboratory
Crushing Rolls**

Sizes (Diameter x width): 8"x 4", 10"x 6", 10"x 8", 12"x 10" and 12" x 12". Adjustable roll space setting up to 3/4". Double V-belt drive. Heavy, cast Meehanite frame absorbs vibration, results in long life.



**Massco-McCool
Pulverizers**

Disc type grinder with a planetary movement. No gears. Will grind 1/4" to 150 mesh in one pass.



**Marcy Pulp
Density Scale**

Gives direct reading of weight; specific gravity of liquids, pulps, and dry solids; percent solids in pulp. Very accurate. Easy to clean.

MINE AND SMELTER SUPPLY CO.

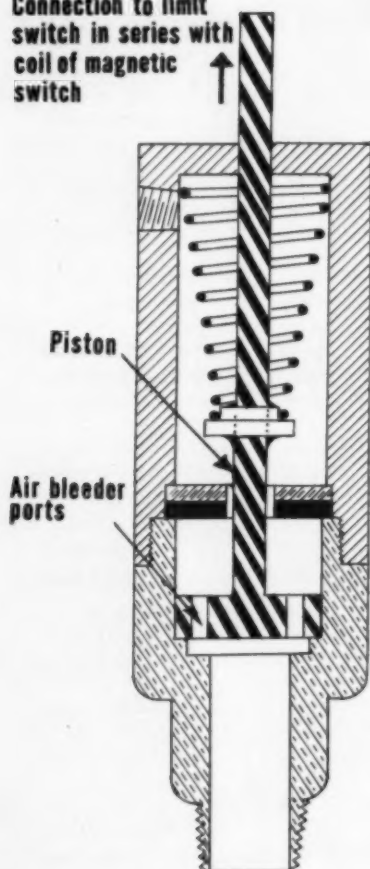
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HINTS & HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Connection to limit switch in series with coil of magnetic switch



Pump safety switch

THIS SHOP-MADE DEVICE cut from red brass is a perfect safety device to shut down a motorized centrifugal type pump in case its prime is lost.

Air clears through the piston openings without causing movement. But as the air is eliminated in time, the resistance to the passage of water forces movement of the piston against the resistance of the spring. Then a limit switch in the starter circuit of the motor is tripped to call for attention from an operator.

Warren Cross, Oak Ridge, Tenn.

How to take out a carriage bolt

HAVE YOU EVER been confronted by the vexing problem of removing a carriage bolt when the nut was rusted on? The squared portion of the shank bites into the wood to prevent the bolt from turning. But the wood frequently weakens and doesn't hold. As a result you have a tough time removing the bolt.

By sawing a slot in the head of the bolt with two hacksaw blades held side-by-side in the saw frame, the bolt can often be held with a screwdriver. It is true that this cannot always be done even by soaking the rusted nut in oil, although there are excellent oils on the market for that purpose.

W. F. Schaphorst, Newark, N. J.

Conveyor belt improvements

RADICAL CHANGES in the profile of conveyor belts have seldom lasted more than a few years at best. Invariably, their higher cost and need for specially-designed idlers has limited their widespread use. Then, too, when rubber was difficult to get, manufacturers dropped their lines of special conveyor belts.

Just the same, rock products producers continue to look at new conveyor belts in the hope of finding better ways of doing difficult conveying jobs.

An English mine handles rock on a belt conveyor with rubber flanges molded to the edges of the belt. The flanges increase the load-carrying capacity between 25 to 50 percent. Apparently the belt operates on flatroll idlers which are less expensive than conventional troughing idlers.

In the United States, a gypsum producer has brought in a new conveyor belt from Germany. This belt has molded rubber ridges that look like corrugated steel apron pans. The belt is reinforced and stiffened with steel plates, and the load is carried by a steel roller chain under the belt.

The action of this conveyor is very

much like an apron conveyor, since it can convey at 30 to 40-deg. incline. Since it does not use ordinary supporting idlers, there would be some question about the economy of a direct substitution for a conventional belt conveyor.

Standard belts with ridged or cleated surfaces are not new by any means. All too few producers who must handle washed sands, washed gravels or washed stone use these belts to improve materials handling efficiency. Yet many rock products producers have found that these belts—especially those with herringbone ribs—pay dividends in increased production.

Gasket selection and installation

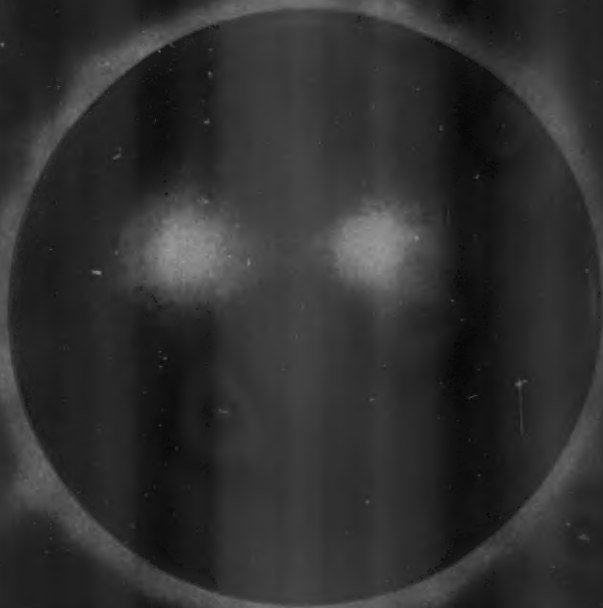
IN THE SELECTION of gaskets there are a number of things that must often be considered. For instance, to what temperature will the gasket be subjected? Temperature has much to do with proper selection. Thus if the gasket will not be heated about 240 deg. F. it can be a non-metallic gasket. If it will be heated to a range between 240 and 800 deg. F. an asbestos or asbestos covered gasket may serve the purpose.

What kind of flange is to be gasketed? That is an important question. It is the flange that usually determines the type of gasket to use. Next comes the factor of pressure. Is it a liquid? Gas? Steam? Is it corrosive? Upon these things depend the kind of gasket material to use. You must not use rubber, for example, if the fluid is gasoline. You must not use copper if the gas is ammonia.

What is the nature of the flange surface? It must be smooth to facilitate perfect sealing. Perfect contact between the gasket and flange surfaces is essential to assure tightness and prevent leakage. Rough flange surfaces, such as we all too commonly see, are a liability. The notion that roughness

(Continued on page 78)

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IMPORTANT!**



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When ready for grinding
Coates Grinding Balls are
ground to size and
finished to meet
specifications and quality.

The early forge man, the blacksmith, knew by the particular shade of fiery red when steel was heated to the right temperature for perfect heat treatment. The modern heat treater uses automatic temperature controls to maintain the same color and temperature to guard his quality. Each Coates ball is controlled for this important step in heat treatment and is typical of the care in manufacture, the rigid quality controls and adherence to product specifications that guarantees the uniformity of Coates Triple-Forged Carbex Grinding Balls.

Coates Grinding Balls are made of fine-grained, high-carbon steel. They are especially forged to attain more perfect sphericity, then heat treated to extreme hardness, but with toughness to prevent shattering under the stress of milling. Call for Coates Triple-Forged Grinding Balls . . . built with care for longer wear.

CS57-4



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STEEL PRODUCTS COMPANY

GREENVILLE, ILLINOIS

LARGEST EXCLUSIVE MANUFACTURER OF GRINDING MEDIA

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ROCK PRODUCTS, August, 1960

HINTS AND HELPS

(Continued from page 76)

is necessary to prevent gasket slippage is fallacious.

How can a thin and flimsy gasket be installed between flanges already in place in a pipe line? Do it in this way. Cut out two pieces of thin sheet metal, one end being rounded to the same diameter as the bolt circle. This is the same as the outside diameter of the gasket.

Place the gasket between the two pieces of sheet metal and then insert the assembly carefully between the

flanges. Then withdraw one of the pieces of sheet metal at a time, leaving the gasket behind in the correct position for bolting the flanges.

Before inserting the gasket between the pieces of sheet metal make certain that no surface is "sticky" at any point so that the position of the gasket will not be disturbed when the pieces of sheet metal are withdrawn.

W. F. Schaphorst, Newark, N.J.

Air-operated gates

GATES fitted with air cylinders are probably the easiest to open and close

from a remote location. There are few problems when each gate is close to the control point, and each gate can be served by a short run of piping or air hose.

Rock products producers have had to exercise their ingenuity to control



a large number of gates in long tunnels from remote control centers.

Possibly the most popular method has been to put an electrically operated air valve at each gate. Then a single, large diameter air line is run the length of the tunnel or bins with a flexible hose tapping the main line. A parallel conduit carries the necessary wiring. The valve operates only on signal from the control station while air pressure does all the work.

Using electricity to operate the gates permits lots of flexibility in the system. Relays can be introduced into the circuits to open or close gates in planned sequence or they can be interlocked with the motors on conveyors and other equipment. Tell-tale switches can be installed as safety devices to signal when the gate is open or material is not flowing through it.

Retaining wall



A WESTERN PRODUCER teamed up prestressed concrete shapes with steel culvert to make a surge pile on top of a hill.

Prestressed concrete columns were sunk into the ground. Then the prestressed panels were inserted. The steel culvert reclaim tunnel is fitted neatly between two posts and concrete was poured around it to hold it in place. The retaining wall is plenty strong enough to take the horizontal thrust of the toe of the surge pile.

If the site were ever abandoned, the wall could be easily dismantled.

END

Screen Story...



Fannin Gypsum Co., Lost Hills, Calif., operates this novel plant "on the run" (2 to 3 mph) producing up to 300 TPH of -7/8" agricultural gypsum. The mobile unit, designed and built by Carter Machine Shop, Wasco, Calif., scoops up the gypsum with revolving blades and delivers it by conveyor belt to an Overstrom gypsum with revolving screens. Oversize drops into a hammermill, then 4' x 10' Single-Deck Vibrating Screen. Oversize drops into a hammermill, then joins the undersize on a swivelling stacking-belt which deposits the product in windrows parallel to the line of travel. Overstrom engineers, working with the builder, adapted the screen to very limited headroom.

The advantages of using Overstrom Vibrating Screens go far beyond what meets the eye.

Not only does every model have Overstrom's quick-change unitized vibrator cartridge with oil-bath bearing lubrication; custom-built involute springs; patented stretcher bar lifters to speed cloth changes; extra heavy-duty mine car rail cloth supports capped with broad, thick snap-on neoprene cushions; and many other service-tested features—there is also Overstrom's fifty years of specialized engineering and manufacturing experience. This means that, even under unusual operating conditions or requirements, you can have Overstrom's guaranteed performance on the job without delay.

OVERSTROM

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(write for catalog and pictorial case histories.)

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B.F. Goodrich helps change the face of a river



40 TONS OF CONCRETE ride to the bottom of Barkley Lock on B.F. Goodrich Rock Service tires. These gigantic tires (over 6 feet high) are built with B.F. Goodrich Flex-Rite Nylon cords that withstand double the impact of ordinary materials, resist heat blowouts and flex breaks. The new B.F. Goodrich Cut Protected tread compound guards against the kind of severe rock cuts and chipping found on such projects as Barkley Lock.

Hundreds of B.F. Goodrich tires—and other products—speed development of Cumberland River Basin

TWENTY-FOUR miles east of Paducah, Kentucky, they're changing the face of the Cumberland River. Here Barkley Dam will rise to a height of 155 feet, forming 62,000-acre Lake Barkley—key units in the development of the Cumberland River Basin.

This \$182-million project (including construction of a lock, power plant and canal) will provide flood control, improve navigation and produce 600-million kilowatt-hours of energy a year. The completed lock will have a chamber 110' x 800' and a lift of 52' to 57'. Five outmoded locks will be eliminated.

On the job: Tecon Corporation, general contractors of Dallas, Texas, who have chosen B.F. Goodrich tires, industrial products, protective clothing and footwear 100%. BFG Special Contractor's Representatives work hand-in-glove with Tecon on all phases of Barkley Construction.

This B.F. Goodrich report continues ►



Wherever you look at Barkley Dam you'll see B.F. Goodrich tires on the job

HELPING Tecon Corporation meet the challenges of the \$182-million Barkley Dam project are a corps of B.F. Goodrich on-the-scene specialists and scores of different B.F. Goodrich products.

Giant BFG Rock Service tires haul concrete and rock. Rock Logger tires deliver fly ash. B.F. Goodrich All-Purpose tires support a "cement hog." Traction Express and Power Express tires bring in supplies. Power Grader and Universal tires move earth.

This is only the beginning. You'll find B.F. Goodrich hose delivering air, water, even dry cement. BFG V-belts drive pumps, crushers and vibrator screens.

Conveyor belts carry sand and aggregate. And the 700 Tecon men on the project wear B.F. Goodrich protective clothing and footwear.

To keep the whole job humming, B.F. Goodrich provides special maintenance and service facilities, all part of the new B.F. Goodrich Unified Contractor Program. If you want to cut the cost of doing business, it will pay you to talk to B.F. Goodrich. Your Smileage dealer is listed in the Yellow Pages. Or write *The B.F. Goodrich Company, Akron 18, Ohio.*

Specify B.F. Goodrich Tubeless or tube-type tires when ordering new equipment



AT BARKLEY LOCK, workman rough up concrete surface for new pour. BFG hose carries air and water under high pressure. Yellow rainsuits and footwear protect men. B.F. Goodrich Unified Contractor Program provides Tecon with everything from tires to boots to belts.

◀ **24 HOURS A DAY, 6 DAYS A WEEK**, trucks haul tons of rock out of Barkley Dam excavation. Haul roads are steep and strewn with abrasive rock. Yet B.F. Goodrich Rock Service tires are so rugged that many actually can be retreaded up to 3 times on this operation. Note BFG Servicemobile, at work as usual.



B. F. GOODRICH CONVEYOR BELTS AND HOSE arrive at Barkley Dam on tractor-trailer equipped with Power Express and Traction Express tires. (Users call the Traction Express the "100,000-mile tire.")



CONSTANT TIRE INSPECTION by B.F. Goodrich on-the-job service men avoids delays, lowers operating costs. Servicemobile is equipped with all the latest power tools. Complete stock in B.F. Goodrich Tire Service Building (built for this project) includes BFG batteries used in all Tecon motorized equipment.



SPECIALLY BUILT TANK TRUCK delivers 30 tons of fly ash. Tecon Corp. chose rugged B.F. Goodrich Rock Logger tires because the extra-thick tread defies rock cuts, gives positive traction in forward or reverse. 125 pieces of equipment work on Barkley Dam which will have an overall length of 10,020 feet.



B. F. GOODRICH ALL-PURPOSE TIRES (as at home in the rough as on the highway) give mobility to "cement hog" that carries dry cement to batch plant. BFG contractor's program helps Tecon simplify purchasing, eliminate confusion, cut equipment and operating costs.

OFF-THE-ROAD TIRES BY

B.F. Goodrich

Profile of a model sand & gravel plant



Material travels up this 455' inclined conveyor at a rate of 450 fpm to screening tower 170 feet above excavating level.

New Long Island plant handles ... standardizes on 10 Deister

Virgil M. Price, President of East Coast Lumber Terminal, Inc. of Farmingdale, L. I., has spent many years in the heavy construction, mining and quarrying industries. You

can see evidence of this experience in every detail of his company's new West Hills Sand & Gravel Plant. Opened in May, this ultra-modern plant was designed under the per-

sonal direction of Mr. Price, and can easily hold its own with the finest in the country. Its production capacity is an impressive 900 tons per hour.

The West Hills plant is working about one square mile of highgrade bank sand and gravel averaging 40 feet in depth and underlaid with a 310-ft. deposit of pure silica sand. Gravel is dug by a shovel equipped with a unique 2½-yd. bucket. Across the bucket opening are steel bars welded at 6" intervals. These bars serve as a built-in grizzly, nudging aside the small percentage of +6" rocks occasionally found in the bank.

The shovel dumps onto a 105-ft. horizontal conveyor with a belt speed

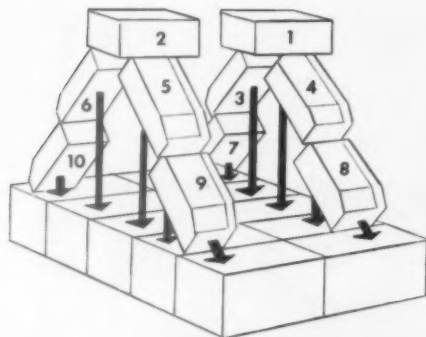


VIRGIL M. PRICE

Virgil Price tells why he specified Deister

"I like Deister Screens because I know from experience what they can do. East Coast Lumber's first Deister Screen was a triple-deck 5 x 10 installed in 1945. The first 3½ million tons of bank run feed with 44% gravel were run over that screen with total repairs of less than \$1,000. This averaged out to about 29 cents per thousand tons. Three additional

Deister Screens did an equally good job and that's why this new West Hills plant is all-Deister."



of 450 fpm. This primary conveyor discharges into a pan feeder onto a second horizontal conveyor which can be lengthened up to 5,000 feet as the bank is worked farther away from the plant. A 455-ft. inclined conveyor takes the material to the top of the screening tower where it discharges into a 58x68" feed box.

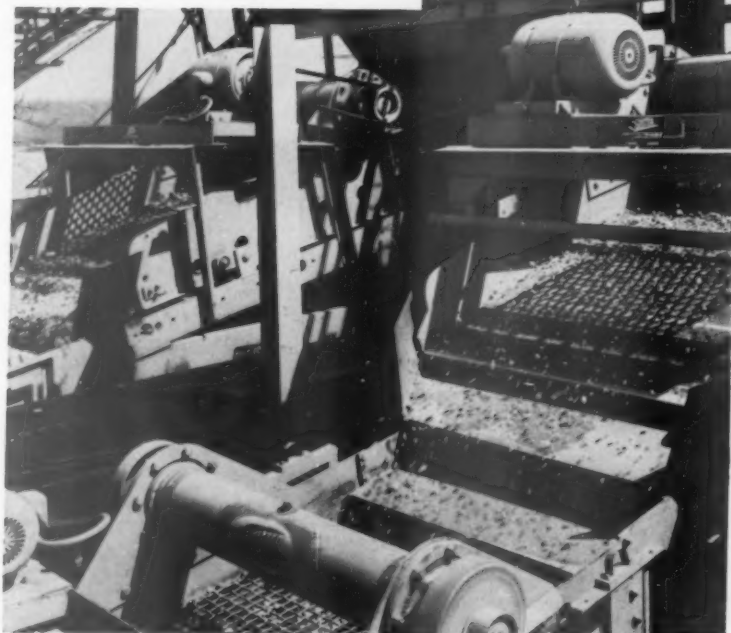
Screening sequence (refer to schematic drawing):

A—Feed box splits material to two 4' x 8' single-deck Deister Scalping

Screens (#1 and #2) mounted back to back and equipped with 2½" opening screen cloth.

B—The -2½" material through the scalpers is split to two pairs of single-deck 5' x 10' Deister Sand Screens. The first pair of sand screens (#3 and #4) have ¾ x 4" cloth openings; the second pair (#5 and #6) have ¼ x 4" openings. The -¾" and -¼" material drops directly into storage bins.

Below: Screening process begins here as feed box splits material onto two Deister Scalping Screens mounted back to back. Bottom left: Key to high volume at West Hills is the speed and accurate sizing ability of Deister Screens. Shown are two of four Deister Sand Screens. A Deister Gravel Screen is in the foreground.

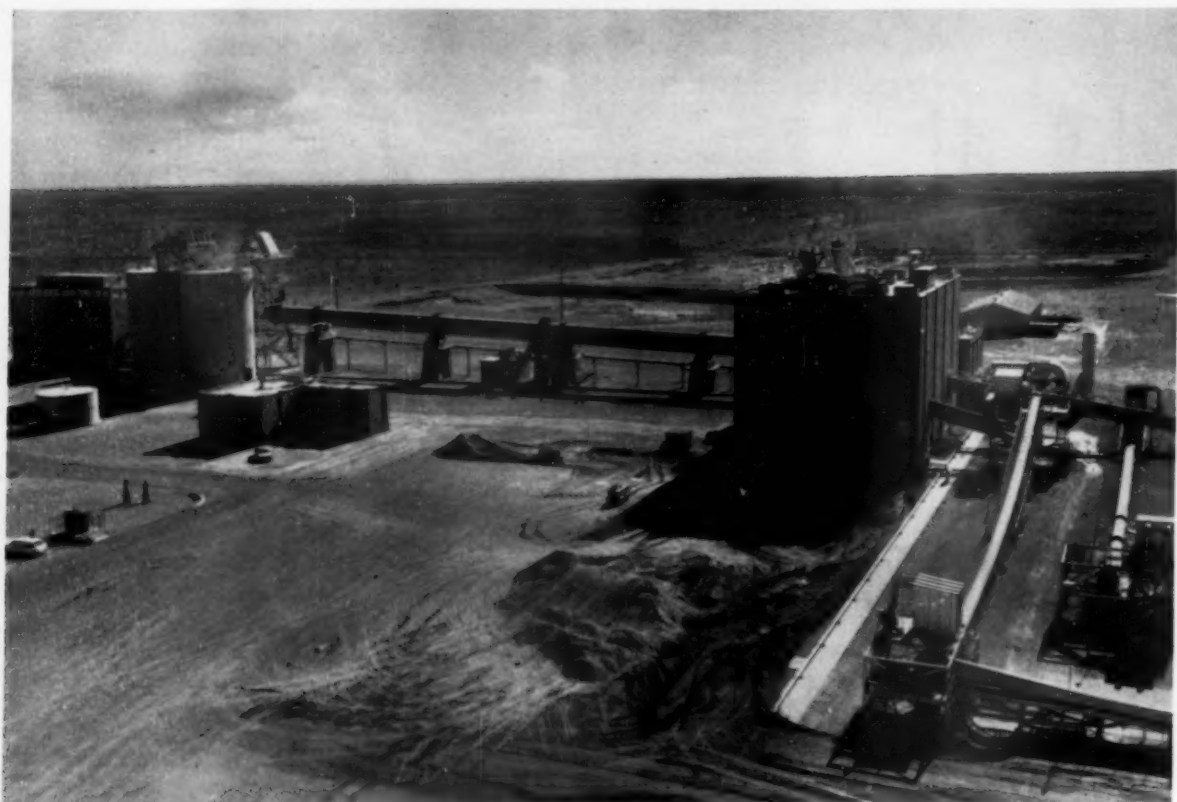


Plant Supt. Joe Rypka surveys the entire operation from control room atop the screening tower.

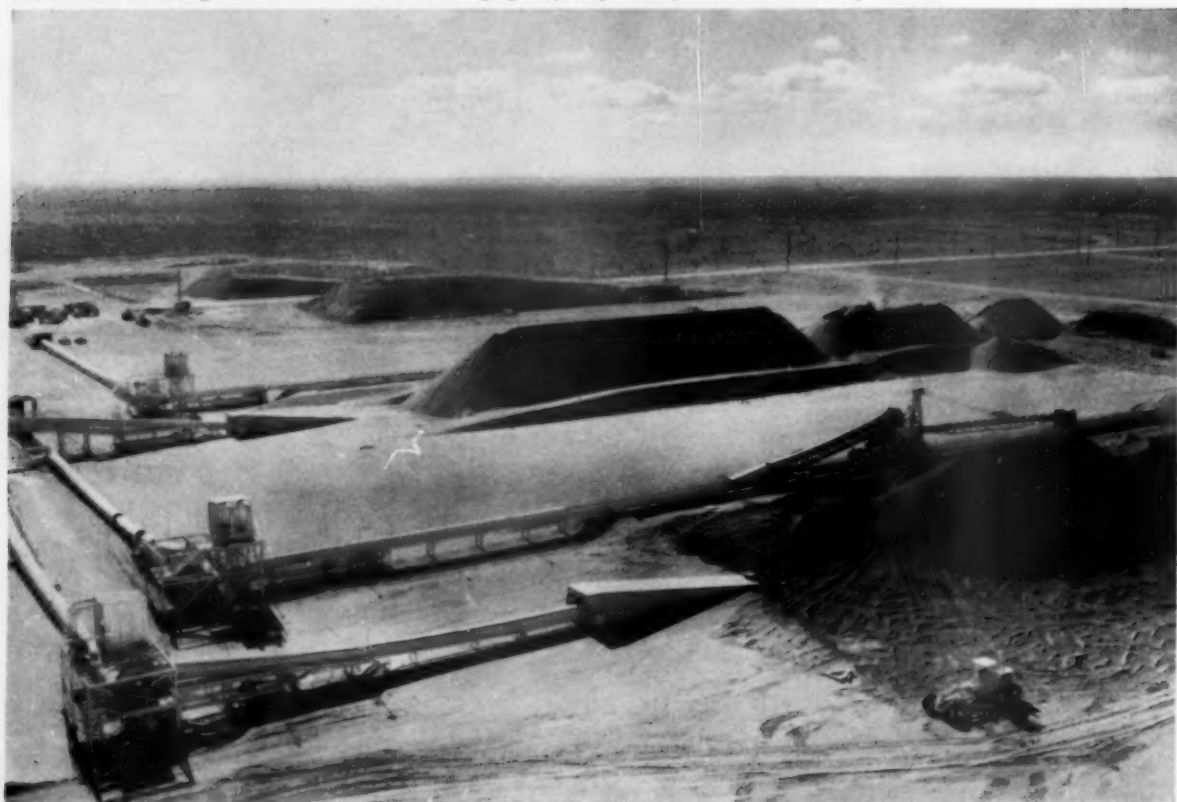
DEISTER MACHINE CO.
1933 E. Wayne St., Ft. Wayne, Ind.



Enter 1007 on Reader Card



RAW MATERIALS FOR GRINDING are brought to mill building, right; finished kiln feed is pumped to one of two blending silos, left
BELT CONVEYORS taking materials into and out of storage greatly simplified layout and construction problems



*Open-air storage and conveyor network
key Southwestern Portland's plans for
low-cost expansion at new Odessa plant*

Climate and design spur cement plant construction

by Elwood Meschter

HOW LONG DOES IT TAKE to put up a new cement plant? Eighteen months to two years is not unusual. But with favorable climate, ingenious layout and excellent performance of equipment makers, it can be done in a year. This was the experience of Southwestern Portland Cement Co. when its directors decided to supplement its El Paso production by building at Odessa, Texas.

Actual construction for the 1¼-million bbl. dry process cement plant started on a large tract west of Odessa in September 1958. First cement was made early in May 1959—just a year from the time the directors issued their “go-ahead.”

The new plant was designed for future expansion as well as for rapid construction. Capacity in every department can be drastically increased with relatively small investment. And more kinds of cement can be made to meet the needs of the market area. For the present, the plant will make cement most suitable for the demand of the Permian Basin and the more than 50,000 oil wells that dot the plains of western Texas. These are Type I, “coarse” and quick-set cement.

A dry climate in Odessa was the primary factor in reducing construction time, since costly weathertight buildings were not needed. Only the mill building and kiln control center are completely enclosed. A storage hall is not in the layout. Instead, raw materials and clinker are stored on the ground in two parallel storage and reclaim systems using belt conveyors.

These belt conveyor systems contributed to saving a great deal of design and erection time. At the same time, they kept materials handling investment low. Simple to lay out, the conveyors and stackers were installed rapidly without interfering with other construction projects.

Belt conveyors fitted naturally into a ground storage and reclaim system for the raw materials and the cement-making materials used in the new plant. Each must be handled separately and kept segregated in storage piles. Concrete tunnels with reclaim belts run the full length of each storage system. Two or more vibrating feeders with variable speed controls under each pile put materials into the reclaim conveyor system for the trip to the mills.

Three of the four raw materials are found on the property. These are caliche, a hard limestone and a shaley limestone. Caliche forms overburden on much of the tract. Once the thin topsoil is scraped off, a 4-cu. yd. diesel shovel moves in to load out the material into a pair of 34-ton, side-dumping trucks. Although the caliche is normally fine and granular, it is put through the primary crusher to reduce any plus 1½-in. lumps.

Just under the mantle of caliche is a ledge of high-grade limestone. This 16-ft. deposit is drilled and blasted about once a week. But blast holes are put down just deep enough to leave a foot or so of the hard limestone to protect the softer shaley limestone just beneath. This makes a natural pavement to support the trucks while the rock is loaded out and provides a firm support for the drill rig to get the lower formation ready for blasting.

A 16-ft. deposit of lower grade shaley limestone is also used to make cement at Odessa. After it is blasted, it is loaded out with its own 3½-cu. yd. electric shovel and taken to the primary crusher. Iron-bearing copper smelter slag is received by rail and sent direct to storage.

The primary crushing station is equipped with a hammermill rated at 450 tph. It is fed with a

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VIBRATING FEEDERS under four piles of raw materials, and the four cement-making materials, are controlled from this board in the plant chemist's office



A WEIGHING SCREW FEEDER discharges kiln feed to the boot of a bucket elevator; dust comes into system from left

OPEN-AIR INSTALLATION of equipment speeded construction. The duct loop helps knock down high temperature of the kiln exhaust gases



CLIMATE AND DESIGN SPUR CEMENT PLANT CONSTRUCTION

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heavy-duty apron feeder whose speed is controlled by the load on the crusher. As long as a relatively fine material is fed, the crusher will operate at maximum capacity. But when the ammeter control senses that the 600-hp. crusher motor is drawing more power, the device signals for the 20-hp. feeder motor to slow down. As the load clears from the crusher, the feeder is speeded up.

The crusher area is equipped with an overhead crane and a dust collector system. An overhead crane serves two purposes. It handles motors, rotors and other parts of the crusher and its feeder when maintenance is needed, and it hooks out blocks of limestone too large for the throat of the crusher. A dust collector controls the dry, dusty fines that arise as rock and caliche are dumped into the feeder hopper. This dust collector is the first of many in the plant that pick up dust wherever it is generated.

Each of the two storage areas is about 600 ft. long. All materials are put into piles about 120 ft. wide and 40 ft. deep. Normally about 20,000 tons of limestone are needed in storage, about 8,000 tons of low-grade shaley limestone, 4,800 tons of caliche and about 2,300 tons of slag.

A parallel system for cement-making materials holds about 5,000 tons of gypsum, 5,000 tons of shell limestone and two piles of clinker, each with about 20,000 tons.

Each storage area is served by a traveling stacker with an 85-ft. conveyor boom. Travel of the stacker is controlled automatically to distribute materials the full length of each storage pile or to put material into a single pile. Once the travel distance is set, the cycle of operation is automatic until the pile is completed.

This is achieved by an electronic feeler gauge suspended from the end of the stacker boom. When it senses that material is too close to the head pulley, a circuit closes. A small motor operates the winch to raise the boom slightly. When the boom has reached its upward limit at the top of the pile, a signal sounds a warning.

Another instrument protects the big stacker from wind damage. When a gauge senses wind velocity of 35 mph., a siren sounds and a time delay relay operates. If the operator doesn't turn off the siren in the measured time, the relay releases the boom winch to lower the boom into the pile of material. This system gives the operator the opportunity to move the traveling stackers to the end of their runways where their booms can be secured to an earth embankment.

The raw materials stacker is used to transfer crushed materials to the adjacent area holding cement-making materials. It puts high-grade limestone into trucks for the short haul to maintain the 5,000-ton pile of this material. The same method could be used to handle raw gypsum or other materials coarse enough to need crushing before storage.

Each storage area can be readily enlarged by extending it nearly 300 ft. westward. The concrete reclaim tunnels can be lengthened, as can the existing conveyors and rail to support the traveling stackers. Even the capacity of the existing reclaim system can be stepped up by taking out the concrete plugs in the blind openings in the concrete reclaim tunnels and adding vibrating feeders.

Parallel belt conveyors take kiln-feed materials or cement-making materials from the two storage areas to the mill building. The proportion of each material is determined by the plant chemist and the speed of each vibrating feeder is adjusted to maintain this ratio. The controls for the proportioning feeders are placed in the plant chemist's office. Normally, the only control the miller has over the feed to his mills is to regulate the volume of material going into each mill.

A sampler and X-ray analysis setup gives the chemist almost continuous control over the ingredients going to the mills. Raw materials for kiln feed are sampled automatically and continuously. A composite sample is analyzed every hour. Cement samples are taken every four hours. The X-ray emission gauge takes 25 to 35 min. to give an accurate analysis of each sample. Then the plant chemist makes any changes in the speed of the vibrating feeders to bring the mix back to standard.

Each sample is reduced to a minus 200 mesh powder and pressed into a wafer. Each wafer is sprayed with a plastic and inserted in a lucite plastic holder before it is subjected to the stream of X-rays. Each sample is compared with a wafer made from a standard sample that has been checked by wet analysis. All wafers must be freshly prepared. It would be ideal if the standard sample could be kept permanently in a wafer, but it has proven to be too delicate to withstand frequent handling.

Southwestern's milling department has two 11½ x 17-ft. mills—one for raw grinding, the other for cement. Each mill is charged with a belt conveyor, last unit in a conveyor system that

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CLIMATE AND DESIGN SPUR CEMENT PLANT CONSTRUCTION

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starts in the storage area. A scale on the belt ahead of each mill weighs and totals the amount of material put into the mill.

Each mill operates in closed circuit with an 18-ft. diam. air separator that strips out oversize. Capacity of each mill is about 60 tph. of kiln feed and 30 tph. of finished cement. Accepted material out of each mill passes through a continuous, automatic sampler.

Kiln feed milling equipment is fitted with gas-fired heaters to dry the materials in process. The bucket elevator and the mill vent dust collector each have a heater, while the air separator has two in its conical bottom. Finished raw materials are pumped to one of two blending silos, and finished cement is pumped to one of ten storage silos.

The blending silos each hold about 4,500 bbl. of milled raw materials—enough for about 30 hr. operation of the big kiln. Normally, one silo is filling and homogenizing while the other is discharging to the kiln.

Great flexibility has been designed into the kiln feed circuit. A "bubble tank" or withdrawal box receives material from either silo through an air-slide conveyor. A high-level control in the top of the box prevents these conveyors from filling the system faster than material moves out through the bottom of the box. An adjustable gate controls the flow of material into a screw conveyor. This conveyor discharges kiln feed into a reversible screw conveyor that ordinarily carries material a short distance back to a weighing screw.

The weighing screw is adjusted to convey just a little less material than the supply conveyor and in this way it is always kept full. Excess feed continues on and is discharged into the boot of an elevator that returns it to the top of the silo.

The raw weighing feeder itself is in closed-loop control, a small weighing screw feeder returning dust to the kiln feed system. When the dust load is heavy, incoming new feed is throttled back to keep the total feed constant. As the returning dust load tapers off, the new material feeder speeds up and automatically calls for more raw material from the silo conveyor.

Alternative flows of material add to the flexibility of the system. It is possible to bypass the weighing feeder and its controlling influence. By changing the direction of the reversible conveyor, all material can be discharged into the boot of the kiln-supply elevator. The withdrawal box itself can be bypassed by a screw conveyor system that can

take kiln feed right out of the bottom of either of the silos. Nor is it necessary that all material go to the kiln; the conveyors can be used with the elevator to recirculate the material out of and into either or both silos. A small sampling chute under the silos lets the plant chemist take samples of kiln feed at this point as a check on the material actually going into the kiln.

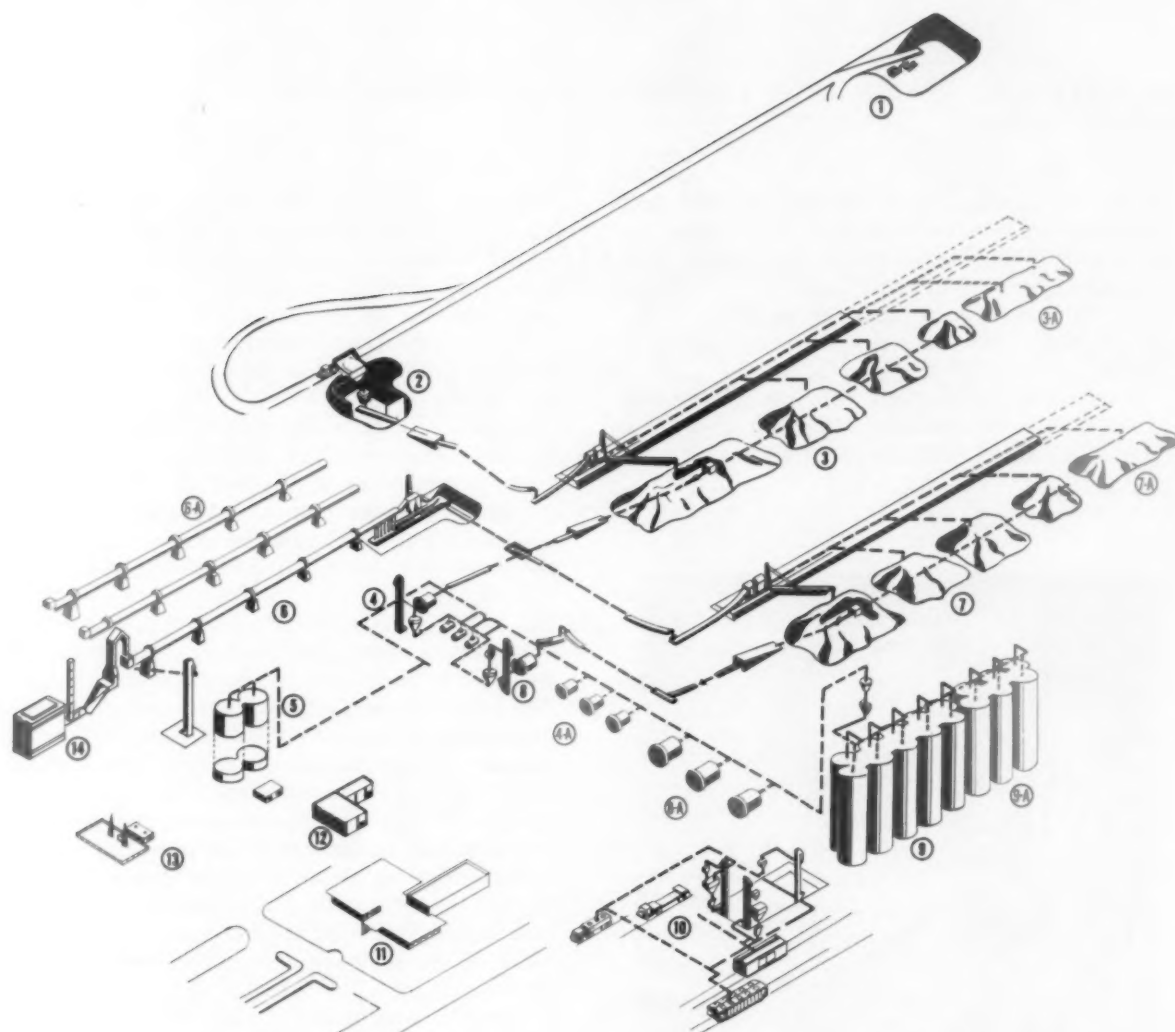
All dust is returned to the kiln feed circuit. A small screw conveyor system brings dust from the baghouse collectors. It is joined by a screw conveyor system bringing coarse dust from the multiple cyclone dust collector near the feed end of the kiln. All this dust is put through the dust weighing system mentioned above. An elevator takes kiln feed and elevates it high above the end of the 11½ x 400-ft. kiln. This is a gas-fired unit that burns locally-produced natural gas.

Heat from the 1,200 to 1,400-deg. F. exhaust gases is dissipated by radiation from a huge duct-work loop and by air infiltration into the system. By the time the exhaust reaches a bank of multiple cyclones the temperature has been reduced to 800 deg. or less. A hot gas fan pushes the

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AN X-RAY EMISSION GAUGE analyzes samples of kiln feed in a fraction of the time required by conventional methods

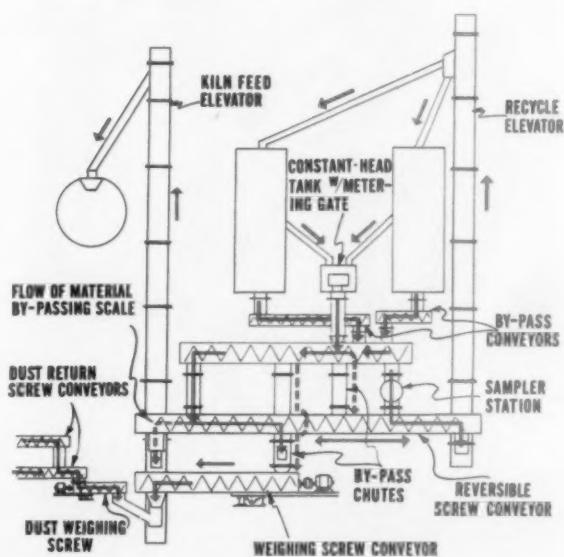




KEY TO ARRANGEMENT OF PLANT

- 1—Quarry
- 2—Crushing system
- 3—Raw material storage
- 3A—Raw material storage extension
- 4—Raw material milling
- 4A—Mill extensions
- 5—Blending silos
- 6—Kilns
- 6A—Future kilns
- 7—Clinker and cement-making storage
- 7A—Future extension of cement-making materials
- 8—Cement milling
- 8A—Mill extensions
- 9—Storage silos
- 9A—Future silos
- 10—Packhouse and shipping area
- 11—Office and laboratory
- 12—Water treatment and admix
- 13—Transformers and switchgear
- 14—Baghouse dust collector

BELOW: A system of screw conveyors brings raw kiln-feed materials from storage silos and dust collectors



CLIMATE AND DESIGN SPUR CEMENT PLANT CONSTRUCTION

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stream of gases to a baghouse dust collector that strips out the last traces of dust. This collector is fitted with 1,728 silicone-impregnated glass fiber bags arranged in four banks, each with two sections. The sections are rapped in sequence to discharge dust into the screw conveyor collecting system.

At the other end of the kiln, hot clinker falls to a 7 x 50-ft. horizontal-grate cooler where it is reduced to about 150 deg. F. Two steel trough

oscillating conveyors take the clinker from the kiln area to the first unit in the belt conveyor system leading to the clinker storage area. An occasional surge of hot clinker on the oscillating conveyors can be quenched with hand-operated water sprays. A heat-resistant belt on the first conveyor protects it from damage of an occasional piece of hot clinker.

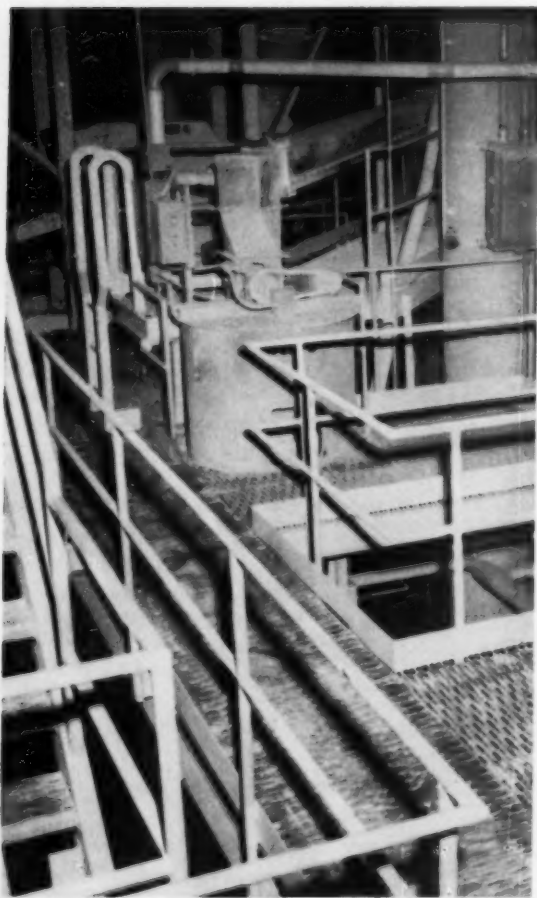
Operation of the cooler is controlled by its undergrate pressure. Grate speed responds to variations in pressure. As the bed of materials gets deeper, the pressure increases. This calls for greater grate speed. As the bed of clinker thins down, the grate slows down too, to maintain the pressure setting.

Even with speedy construction of the new plant, designs for future expansion were not overlooked. The mill building can be extended to accommodate more mills as required by the capacity of the extended storage system. More big kilns can be placed parallel to the one in operation. And there is plenty of room to add the necessary blending silos and auxiliary equipment in the area.

More silos can be added to the shipping system to supplement the 10 now in operation. Railroad tracks parallel a roadway for trucks and silos can be built in the clear space between, as an extension of the existing silos.

Airslides and bucket elevators are arranged to permit particularly rapid truck loading, rail loading or transfer to a packhouse. Trucks can be loaded with 100 bbl. of cement in about 3 min., and a 400-bbl. gondola can be loaded in about 15 min.

END



A SAMPLER takes a continuous cut of the stream of finished material from each mill. The sample is analyzed by the X-ray emission gauge in the plant laboratory

RIGHT: A dry climate and fine raw materials generate a great deal of dust. There is a dust collector at the primary crusher and at every other point in the plant that would produce dust



Supreme Court, Congress rule against rock producers

by Joseph N. Bell

TWO EVENTS OF UNCOMMON IMPORTANCE to all rock products producers took place in Washington, D.C., late in June:

1. The Supreme Court of the United States ruled in favor of the Treasury Department in its tax case against the Cannelton Sewer Pipe Co. of Cannelton, Ind.

2. The Congress passed the Public Debt & Tax Rate Extension Act of 1960, which contained some important new passages detailing cut-off points on rock products—particularly portland cement—to be used in figuring percentage depletion.

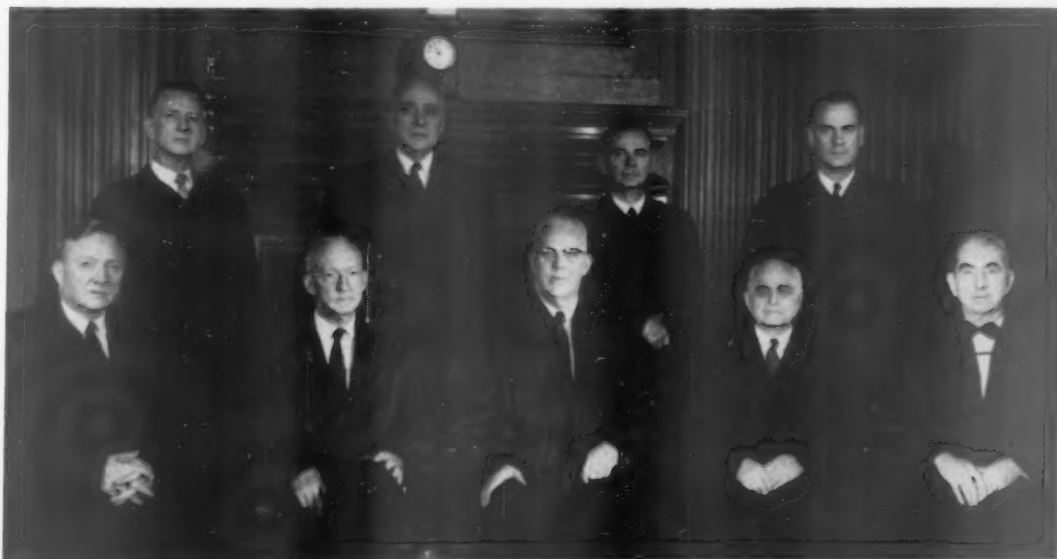
Either event, taken alone, might appear dis-

astrous to rock producers. Indeed, some producers have adopted this view. But there are others who feel that, in combination, these two events may add up to a clarification of the long-standing dispute on cut-off point for percentage depletion. They may reduce the endless succession of lawsuits as the Treasury Department attempts to recover tax deductions taken under liberal judicial interpretations of the fuzzily worded earlier percentage depletion laws.

Opinion is sharply divided in the rock products industries on the expected results of this Congressional and judicial action. Some experts feel that

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THE FINANCIAL STABILITY of the rock products industry rests in the hands of the justices of the Supreme Court of the U.S.; seated, left to right: William O. Douglas, Hugo L. Black, Chief Justice Earl Warren, Felix Frankfurter, Tom C. Clark; standing: Charles E. Whittaker, John M. Harlan, William J. Brennan, Jr. and Potter Stewart



SUPREME COURT, CONGRESS RULE AGAINST ROCK PRODUCERS

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the Cannelton decision and the new law will give Treasury an excuse it will lovingly embrace to crowd the percentage depletion cut-off point back even farther through all the rock industries.

Speaking at the National Sand & Gravel Association convention a few months ago, attorney John Sapienza—one of the nation's foremost experts on percentage depletion—said: "If the Supreme Court accepts the government's argument that in all industries the percentage depletion cut-off is the least processed, the most primitive mineral product in that industry, there is a chance that the doctrine may also be applied to the sand and gravel industry. As a matter of fact, only last week, in arguing another case before the Natural Resources Section, I was told that if the people there have their way, percentage depletion will be applied to the product just as it comes out of the pit—period, right there. With that attitude, it seems to me they will look to see if there is a crude product which is sold in some quantity in the sand and gravel industries. If there is, it could well establish the cut-off point."

On the other hand, a sizeable group of cement industry representatives feel that only the establishment by law of a "reasonable" cut-off point within which both Treasury and producers can operate equitably and predictably would have prevented Congress from taking much more stringent action—goaded by "unreasonable" demands from the industry. This group is hanging no crepe over the recent percentage depletion developments. (For a more complete discussion of this viewpoint, see the article that follows: Did cement producers ask too much in percentage depletion?)

Only time and experience will show which point of view is more accurate. To help you draw your own conclusions, here are the major facts behind these two important decisions:

1. The Cannelton case was particularly significant because it represented the first victory for Treasury in its almost endless succession of percentage depletion cases against rock producers.

The Cannelton Sewer Pipe Co., under the concept of the "first commercially marketable product" as validated time and again in lower courts, had figured percentage depletion on the value of its end product: sewer pipe. The Treasury Department sued, contending that the first marketable product was fire clay and shale—although the company could not sell these products at a profit.

Fire clay and shale sold for about \$1.40 a ton,

with a depletion allowance of some 15¢ per ton. By figuring depletion on its finished product, Cannelton was able to realize a depletion allowance of \$4.08. This is a large, unusual and dramatic difference, and far from typical of the problem throughout the rock industries. Treasury chose well—from its point of view—in selecting Cannelton as the case on which to make its stand against rock producers in the Supreme Court.

In spite of the cards stacked on its side, Treasury lost all of the lower court decisions. But on June 27, 1960, the Supreme Court of the United States ruled that "under the mandate of the statute, respondent's 'gross income from mining' under the finding here is the value of its raw fire clay and shale, after the application of the ordinary treatment processes normally applied by non-integrated miners engaged in the recovery of those minerals."

Here, in the Court's own words, is how it explained its stand on the Cannelton case:

"From . . . legislative history, we conclude that Congress intended to grant miners a depletion allowance based on the constructive income from the raw mineral product if marketable in that form, and not on the value of the finished articles . . .

"The findings are that . . . fire clay and shale were 'commercially marketable' in their raw state unless that phrase also implies marketability at a profit. We believe it does not. Proof of these sales is significant not because it reveals an ability to sell profitably—which the respondent could not do—but because the substantial tonnage being sold in a raw state provides conclusive proof that, when extracted from the mine, the fire clay and shale are in such a state that they are ready for industrial use or consumption—in short, they have passed the 'mining' state on which the depletion principle operates. It would be strange, indeed, to ascribe to the Congress an intent to permit each miner to adopt processes peculiar to his individual operation. Depletion, as we have said, is an allowance for the exhaustion of capital assets. It is not a subsidy to manufacturers or the high-cost mine operator. The value of respondent's vitrified clay products, obtained by expensive manufacturing processes, bears little relation to the value of its minerals. The question in depletion is what allowance is necessary to permit tax-free recovery of the capital value of the minerals . . .

"Respondent's formula would not only give it a preference over the ordinary nonintegrated miner, but also would grant it a decided competitive advantage over its nonintegrated manufacturer com-

petitor. Congress never intended that depletion create such a discriminatory situation. As we see it, the miner-manufacturer is but selling to himself the crude mineral that he mines, insofar as the depletion allowance is concerned . . .

"Depletion, as we read the legislative history, was designed not to recompense for costs of recovery but for exhaustion of mineral assets alone. If it were extended as respondent asks, the miner-manufacturer would enjoy, in addition to a depletion allowance on his minerals, a similar allowance on his manufacturing costs, including depreciation on his manufacturing plant, machinery and facilities."

In these words did the Supreme Court of the United States provide an interpretation of percentage depletion that will necessitate a whole new basis of economic thinking and planning for many rock producers.

2. The House and Senate Agreement on new percentage depletion restrictions followed—not coincidentally—immediately on the heels of the Supreme Court decision. It was hardly unexpected.

The House Ways & Means Committee has been conducting seances on percentage depletion for years, and in spite of constant tugging and hauling, there has been no major change in the percentage depletion laws since 1943. During that time, practically everyone has been confused as to just what was the intent of Congress (including, apparently, Congress) in the often obscure wording of the percentage depletion laws, principally with regard to portland cement.

Thus, the Congressional clarification was long

overdue. Whether or not the action taken was equitable remains to be seen. Points included in the new percentage depletion amendments of primary interest to rock producers include:

- Ordinary treatment processes on which percentage depletion can be taken include "in the case of calcium carbonates and other minerals—when used in making cement—all processes (other than pre-heating of the kiln feed) applied prior to the introduction of the kiln feed into the kiln, but not including any subsequent processes;"

- The new depletion amendment continues to embody Treasury's stand against allowing a percentage depletion deduction for fine pulverization;

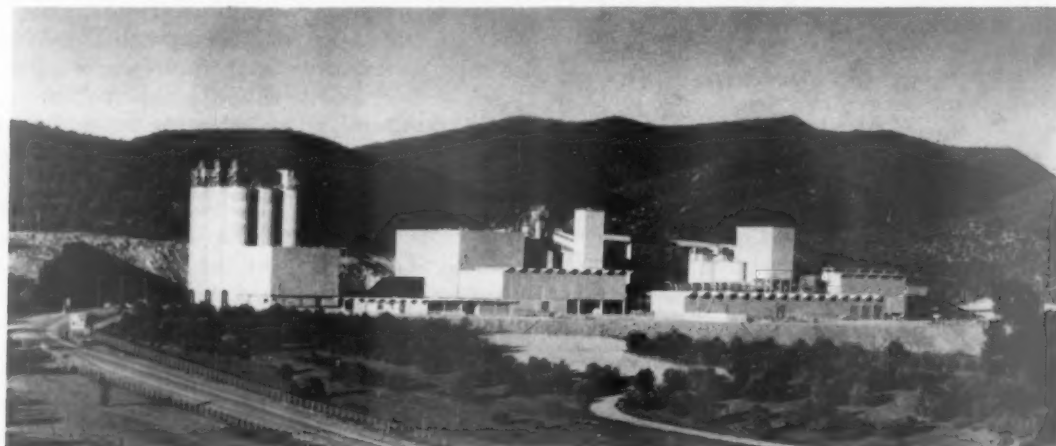
- Other treatment processes not considered for mining for depletion purposes include . . . "calcining, thermal or electric smelting, refining, polishing, blending with other materials, treatment effecting a chemical change, thermal action and molding or shaping."

To summarize: Only the cement industry is materially and immediately affected by the new depletion amendment. For cement producers, the new law means that the kiln feed point in the manufacture of portland cement is clearly established as the cut-off point to be used in figuring percentage depletion.

The results of the Cannelton decision by the Supreme Court are not nearly so clear cut. If Treasury accepts this decision as a mandate to declare open season on rock producers, results may well be disastrous. However, this shouldn't be anticipated—at least not yet. The next move is Treasury's. Rock producers can only wait to see what happens next.

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NEW DEPLETION LAWS will greatly influence the economic operation of portland cement plants



Did cement producers ask too much in percentage depletion?

Editor's Note: The story that follows (now updated) was written almost six months ago. It is an account of behind-the-scenes maneuverings in the percentage depletion Congressional hearings as told exclusively to ROCK PRODUCTS. In spite of the fact that it was an important and timely story when written, the editors of ROCK PRODUCTS decided not to run it while the Supreme Court still had the Cannelton Sewer Pipe case under consideration.

The Court has now ruled, and we believe this story is even more timely today because it gives important background to rock producers in helping them understand the division of opinion in the controversial area of percentage depletion. ROCK PRODUCTS takes no editorial position on this matter. It offers the following account as a summary of the position of a sizeable group of cement producers whose part in the percentage depletion affair has heretofore been both little known and little understood.

LAST YEAR, Congressman Howard Baker (R., Tenn.) told a committee of the American Mining Congress:

"There are three basic questions with respect to percentage depletion: (1) Should there be a percentage depletion allowance for this particular mineral? (2) If so, what should the rate be? (3) At what point in the processing should gross income from mining be computed?

"With respect to several minerals, there is a great deal of controversy between the Treasury Department and the taxpayers over the third question: where is the cut-off point for gross income from mining? Unless a solution to these controversies can be arrived at to the satisfaction of Congress, it seems quite natural that we can expect many members to go back to the first and second questions.

"It was very encouraging to me—and, I believe, to other members of the Ways & Means Committee, to find a substantial number of mineral producers who are honestly and conscientiously trying to arrive at a reasonable solution to the cut-off problem. I feel very strongly that a satisfactory solution must be arrived at to avoid extensive reconsideration of the depletion allowance itself, and the rate thereof."

Congressman Baker has generally shown himself to be a friend of the rock industries. Thus, his statement was not so much a threat as a warning. Don't ask too much, he said, or you may wind up with nothing at all.

Last summer, a sizeable group of cement industry officials who had strong feelings on this point went quietly about an effort to rally the industry behind a compromise bill that would provide cement manufacturers with future depletion based on kiln feed as the cut-off point. Although they were unsuccessful in 1959, the new percentage depletion bill just passed bears the unmistakable mark of their efforts.

This behind-the-scenes story has been told exclusively to ROCK PRODUCTS and can now be reported to the entire rock industry. In March, 1959, Boyce F. Martin, president of the Louisville Cement Co., appeared before the House Ways & Means Committee to present the arguments of a group representing—at that time—about 70 percent of the capacity of the cement industry in the United States. On behalf of this group, he asked

Only the cement industry is materially and immediately affected by the new depletion amendment. For cement producers, the new law means that the kiln feed point is clearly established as the cut-off point for figuring percentage depletion

that Congress retain the "commercially marketable" mineral products rule as it has been interpreted time and again by the courts. There is no reason or justification, said this group, in replacing this rule with a formula based on a differentiation between mining and manufacturing which would inevitably lead to more controversies and discrimination.

Relatively unnoticed at the time was a dissenting statement made by Ideal Cement Co. which wanted to see the marketability test eliminated and kiln feed established as the cut-off point to be used in figuring percentage depletion in the cement industry.

A strong implication, and probably a valid one at the time, was left with Congress that this latter view represented only a very small part of the cement industry—and that the large majority backed the Martin statement. But these two conflicting statements set a great many wheels in motion in the cement industry—wheels that certainly had some bearing on the new percentage depletion amendments.

At the time the cement industry statements were made before Congress, Walter Wecker, president of Marquette Cement Manufacturing Co., was in Hawaii. He cabled Congressman Noah Mason: "Would like you and your committee to know that Marquette and some other large cement companies representing at least 20 percent of total capacity do not oppose Treasury depletion proposals except as to technicalities covered by American Mining Congress brief."

Because of a misunderstanding, this cable was never read into the committee record, and it continued to appear that Ideal was carrying on a lonely battle.

When Wecker returned to Chicago, he was disturbed over the trend the hearings had taken and began to talk percentage depletion with other industry officials whenever he had the opportunity. He discovered that a growing group shared his misgivings.

"Many of us," he recalls, "thought more harm than good has been done to the cement industry as a result of the March, 1959, hearings. We were afraid that in arguing the case for figuring depletion on the finished product, the industry might be destroying what we felt was a much better case—

that is, establishing the cut-off point at the kiln feed. It seemed to some of us that we were being shoved right back to the quarry floor by asking too much."

As a result of these conversations, a small committee volunteered to go to Washington and present its more moderate views. The committee packed considerably more wallop than had the Ideal views at the March hearings because it now represented almost half of the cement industry. (Wecker estimates that at its zenith the group spoke for 46 percent of industry capacity.)

Early in June, 1959, this group met with Congressman Wilbur Mills (D., Ark.), Chairman of the Ways & Means Committee. They suggested legislation—applying only to cement—establishing kiln feed as the cut-off point for the future, while confirming finished cement as the cut-off point for prior years. After full discussion they came away with the impression that the Ways & Means Committee might look with favor upon such legislation.

In July, the group reported back to Congressman Mills that about half the cement industry would support such a bill, and they had hopes of rallying additional support when and if the bill was actually introduced in Congress. At the same time, it appeared that Treasury officials were ad-

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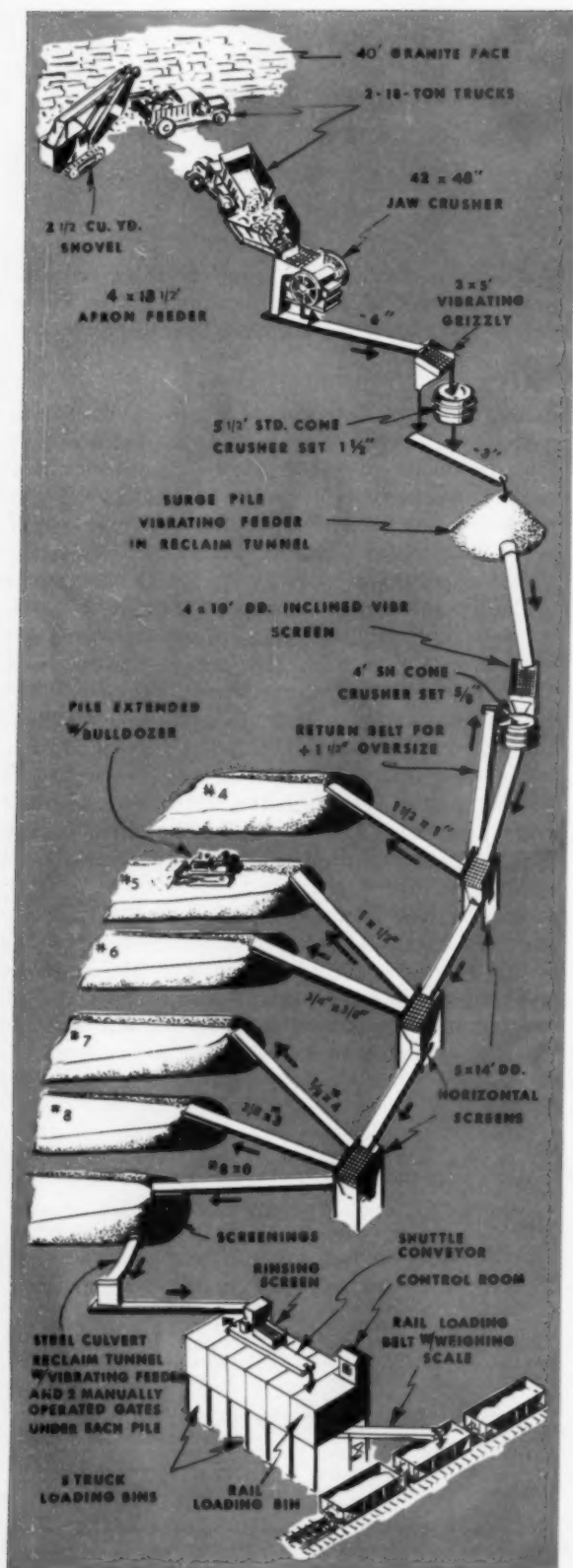
TABLE 1—Federal Income Tax Revenue from Cement Industry

Tax for Year	Traditional depletion basis	End-Product depletion basis	Loss because of end-product depletion
1951	\$ 99,656,000	\$ 73,440,000	\$ 26,216,000
1952	86,130,000	63,385,000	22,745,000
1953	89,493,000	65,777,000	23,716,000
1954	95,945,000	70,606,000	25,339,000
1955	125,604,000	92,493,000	33,111,000
1956	145,300,000	106,833,000	38,467,000
1957	121,287,000	89,200,000	32,087,000
1958	128,839,000	94,913,000	33,926,000
1959	137,028,000	100,879,000	36,149,000
1960	148,164,000	109,077,000	39,087,000
1961	159,554,000	117,462,000	42,092,000
1962	165,277,000	121,675,000	43,602,000

Note: The estimates for past years are based on data in published annual reports of cement companies representing in the aggregate approximately 50 percent of the total producing capacity of the industry. For future years, they are based on the pattern of tax factors for the past applied to volume estimates for the future years.

July 15, 1959

Marquette Cement Manufacturing Co.



THE STRAIGHT-THROUGH FLOW of crushed granite permits efficient processing with only one recycle circuit. Remote-controlled feeders send blends to shipping bins

Newest crushing plant in Georgia

Deft design, pay off for

STRATEGIC LOCATION and sophisticated design are counted on to make Tyrone Rock Products Co.'s new granite crushing plant pay off. Location of the new plant at Yatesville combines several critical advantages. Here, close to the geographic center of Georgia, is one of the southernmost outcrops of granite in the state. From this advantageous position Grade A aggregates can be shipped eastward and southward deep into the coastal plain area of Georgia and northern Florida. This granite-barren market is served by a network of highways and railroads reaching out from Tyrone's new plant.

But the very qualities that make the light gray granite first-rate aggregate are very destructive to processing machinery. The massive rock breaks down to hard, sharp and abrasive particles which call for canny, knowledgeable design of the processing equipment. With the experience of two other granite plants to draw on, the design engineers in Tyrone's organization were able to provide a number of design features to overcome the problems of the material.

Economic application of the producer's experience could only have been achieved with the close cooperation of the manufacturer who did the actual plant layout and construction. Machine selection and operation techniques were combined in this way:

(1) A surge pile has been placed after the secondary crusher. This replaces the usual storage after a primary crusher and eliminates the need for an oversize feeder and belt conveyor to handle large rock. Instead, the minus 3-in. granite is handled on a relatively small feeder and conveyor. The surge storage holds several days' supply ahead of the processing plant and lessens its dependence upon uninterrupted quarry operation.

(2) A single recycle circuit with the tertiary crusher cuts down on the wear and abrasion which

serves granite-hungry markets

right location Tyrone Rock

would result from rehandling in a number of closed circuits.

(3) Horizontal-deck vibrating screens were selected for sizing. It was considered that their retention time and sizing efficiency were worth the cost of reduced capacity.

(4) "Standard" sizes of aggregates are made and stored. State specifications are met and other modifications are made by blending the sizes drawn from different piles.

(5) Rail shipments are metered out of a shipping bin with an automatic weighing control; a gravity track system speeds rail loading and dispatching over a spur of the Southern Railway System.

Six sizes of crushed granite are produced—Georgia Nos. 4, M5, M6, 7, 8 and M10 (screenings). To comply with state regulations the storage pile of each size is pushed out from the end of the stacking conveyor with a bulldozer and built up in layers. All aggregates are washed before shipping except blends which include screenings and specific orders for unwashed materials.

Production through the 400-tph. system started in October 1959 with 29 men. Stripping and quarry-opening work has kept actual production intermittent and well below plant capacity. Even the top of the ledge has few joints and seams and this has retarded development of the quarry.

A pair of drills puts down 3½-in. diam. holes after the thin soil has been removed from the drilling area. For now, a shallow face averaging about 20 ft. high is blasted every two weeks. Broken rock is handled with a 2½-cu. yd. shovel which loads out two 18-ton trucks for the short haul to the primary crusher. A bulldozer works with the shovel to keep the sharp blocky rock close to the face and within easy reach of the shovel.

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A VIBRATING GRIZZLY above the secondary cone crusher scalps off plus 3-in. granite. The fines protect the surge pile conveyor belt from impact and abrasion

DEFT DESIGN, RIGHT LOCATION PAY OFF FOR TYRONE ROCK

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The granite is so dense that there are more large pieces than the crusher can handle continuously. When a dropball is purchased these extra-large blocks can be broken down to more convenient sizes—easier to load out and easier to crush.

The 42 x 48-in. primary jaw crusher is powered with a 200-hp. motor connected through a semi-pneumatic flexible coupling. This relatively small detail was designed to help cushion the shock transmitted back of the motor from the jaw crusher as it breaks down the heavy granite.

A 4 x 18½-ft., heavy-duty manganese-steel apron feeder helps control the flow of material to the crusher. But as long as maximum-size rock is dumped, much of the operator's attention is absorbed by controlling the feeder to prevent a succession of these big pieces from overwhelming the crusher.

Minus 6-in. crushed granite falls to a 42-in. inclined belt conveyor leading to a secondary crusher, a 5½-ft. standard cone set for 1½ in. This unit is protected by a small grizzly which scalps off plus 3-in. rock as it moves oversize to the crusher. Through-grid fines drop past the crusher to the foot of an inclined stacker belt. There the fines form a cushion for crushed rock as it drops out of the bottom of the crusher—another design detail which protects the belt and idlers from abusive wear.

The 40-ft.-high surge pile holds about 5,800 tons of rock—enough to keep the screening plant operating about two days at full tilt. This surge pile serves another useful function, in addition to maintaining a reserve supply if quarry operation ceases for any reason. It affords the operator the opportunity to rebuild a supply of sizes which may be depleted, for there is no easy way of recycling stockpiled material to be resized.

Materials are reclaimed from the surge pile with a vibrating feeder in the roof of the 8-ft. diam., corrugated-steel culvert tunnel. Speed of the feeder is regulated to keep pace with the crushing speed of the tertiary crusher, balancing the volume of rock in the recycle system. But if the feeder should be inoperative for any reason, a manually-operated gate under the pile provides "break-down insurance."

The tertiary crusher (a 4-ft. shorthead cone) is supplied with oversize material returning from the first production screen. Setting of the crusher is matched with the openings of this screen to yield the range of sizes needed to meet shipping requirements: Normal setting of the crusher is ⅝ in. and screen cloth is about 1¾ in. A 4 x 10-ft., double-deck inclined vibrating screen takes out fines ahead of the crusher which, again, protect the belt conveyor from the impact of rock falling out of the crusher. This crusher is fitted with water sprays—as are all other crushers—to suppress dust.

Three horizontal vibrating screens make up the production segment of Tyrone's new plant. These units are all 5 x 14-ft., double-deck models, selected in the expectation that sizing efficiency would offset any loss in volume. "Extra dividends" from the selection proved to be somewhat easier installation and—more important—quicker and easier changing of the screen cloth sections which wear out rapidly when handling the highly abrasive granite.

The first screen makes only one size for storage, usually No. 4, about 1½ x 1 in. Oversize is returned to the tertiary crusher, and the through-screen fines go on to the next unit in the system. Another design refinement was put in at this point: The screen tower was designed to accommodate another stacking belt conveyor, while an extra length of reclaim tunnel was installed to take care of the extra stockpile.

Second production screen makes two sizes for storage, usually 1 x ½ in. and ½ x ¾ in., with the minus ¾-in. fines going on to the third and final

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THE OUTCROP OF GRANITE at Yatesville—near the Fall Line between the Piedmont Plateau and the Coastal Plain—is one of the southernmost in the state

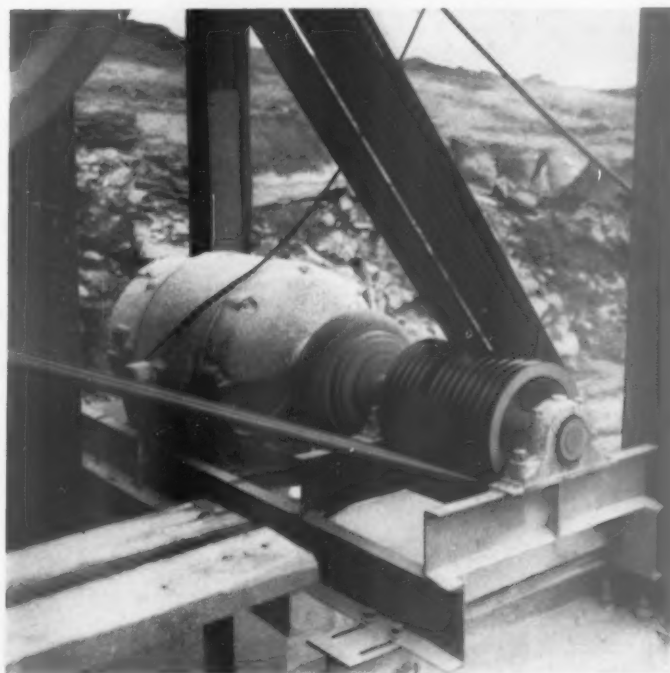




THE SHARP, ABRASIVE GRANITE is broken down to minus 6-in. in a 42 x 48-in. primary jaw crusher



THE HARD, DENSE GRANITE blasts out into heavy block which are destructive to processing equipment



THE DESIGNERS paid attention to small details; this semi-pneumatic coupling on the 200-hp. primary crusher motor is one of them



TERTIARY CRUSHER is a cone which receives oversize from an inclined vibrating screen and recycled oversize from the first production screen



SHIPPING EFFICIENCY is provided by six, 60-ton shipping bins. Five are used to load trucks; the sixth has a boom conveyor to load out rail cars

GRANITE AGGREGATES are built up into storage piles, layer by layer, with a big bulldozer



DEFT DESIGN, RIGHT LOCATION PAY OFF FOR TYRONE ROCK

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screen tower. Here three products are separated and stored—usually Nos. 7, 8 and screenings.

Shipping efficiency starts in the reclaim tunnel, a 450-ft. long steel culvert. Here each pile has a vibrating feeder and two manually operated reclaim gates. The speed of each feeder is set manually according to instructions from the operator in the control tower over the shipping bins. These instructions are determined by the combination of each size needed to make the aggregate specified. Samples are checked carefully at the beginning and end of each run to guard against unusual variations within the size. Checks are made, too, at the beginning of every day of operation.

Truck shipping efficiency is stepped up with the arrangement of five parallel 60-ton bins. These bins are supplied with blended materials from the storage area which are first rinsed on a 5 x 12-ft., double-deck vibrating screen. This is a horizontal unit, placed high above the bins. Not only does it provide ample retention time to allow the granite to be thoroughly washed, but helps to mix the several sizes making up the blend. Through-screen fines are sluiced to a tailings pond. Accepted aggregates are dropped to a shuttle belt conveyor to be taken to one of the truck bins—or to the single rail shipping bin. It is possible to by-pass the screen for shipments of dry aggregates or when screenings are loaded out.

There is ample space for big trucks around the shipping bins. Trucks then move a short distance to the truck scales, now placed in a trailer office. This temporary structure has proven to be ideal to house the scale mechanism and the weighmaster.

Rail shipment is just as effective. The rail bin is equipped with a loading boom which can be raised or lowered to suit the height of a gondola car or to clear a locomotive. The belt conveyor on the boom is equipped with an automatic loading scale to substitute an instrument for an operator's judgement.

After the operator sets the instrument for a specific weight of material, he starts the conveyor which continues to run until the scale has metered out the correct amount of material into the car. When this weight has been reached, the instrument stops the motor on the conveyor. This instrument has paid for itself several times over in the short time it has been in operation. Short-weight cars represent loss of revenue for Tyrone Rock, just as overweight cars do when the extra rock cannot be billed.

Plenty of space was allocated for an extensive



TRUCKS are weighed and dispatched quickly over this 40-ton scale

gravity track system to hold more than 40 gondola cars. More than three miles of track is available. These are important design features for a plant that expects to ship most of its output by rail.

Just as in most new rock products plants, first things have come first, with quarry operations taking priority. Eventually the combined scale house and office structure will be shifted to more permanent buildings. In the meantime, roads must be laid out, stabilized and graded, while garages, shops and other service buildings must be completed.

END

MAJOR EQUIPMENT REFERENCE

Drill, 3½-in. pneumatic	Chicago Pneumatic Drill Co.
Drill, 3½-in. pneumatic	Joy Mfg. Co.
Compressors, (2) 600 cfm. rotary	
Shovel, 2¼-cu. yd.	Bucyrus-Erie Co.
Trucks, 18-ton (2)	International Harvester Co.
Bulldozer, TD-14	
Apron feeder, 4 x 18½-ft.	Iowa Mfg. Co.
Jaw crusher, 42 x 48-in.	
Belt conveyors (17)	
Vibrating screens (5)	
Vibrating grizzly, 3½ x 5-ft.	Nordberg Mfg. Co.
Cone crushers, 5½-ft. std., 4-ft. sh.	Armco Steel Co.
Culvert tunnels, 8-ft. diam.	
Conveyor belts	Boston Woven Hose Co.
Electric motors	Westinghouse Electric Co.
Boom conveyor hoist	Beebe Bros.
Boom conveyor scale	Merrick Scale Mfg. Co.
Bulldozer, D7	Caterpillar Tractor Co.
Truck scale, 40-ton	Winslow Government Scale Co.
Plant design and construction	Iowa Mfg. Co.

Union Rock brackets its market

by John H. Bergstrom

A brace of new, high-capacity sand and gravel plants maintains this producer's leadership in Phoenix' booming construction area

LIGHTNING CAN STRIKE TWICE IN THE SAME PLACE, but rarely does. Almost as rare is the phenomenon of a rock producer putting up two large new plants in the same community within a year's time. But this has happened in Phoenix, Ariz. Spurred on by the building boom, Union Rock & Materials moved to put up two new plants with electrifying speed.

The company recently opened the second of its new plants, in outlying Mesa, east of Phoenix. With a capacity of 600 tph., it supplements the output of the new 59th Ave. plant, a 500-tph. operation west of downtown Phoenix and the 30-year-old main plant, which now turns out 400 tph. With the third plant in operation, Union Rock culminates an expansion program which has nearly quadrupled its productive capacity and solidly entrenched it as Arizona's largest sand and gravel producer.

A quick look at Phoenix's explosive growth gives an immediate answer to why a producer would need two new plants within a year's time. Before World War II, Phoenix was a pleasant green oasis with a population of around 65,000. Today, less than 20 years later, its population tops the quar-



ter-million mark and the surrounding area contributes at least another 250,000. In the last decade Phoenix has grown more than any other U. S. city.

Plant capacity and geography were two problems Union Rock faced as it considered its expansion program. "However, capacity would have seemed to be our only problem," smiles President Kenneth G. Bentson, "if you had seen our main plant last year. We were always on overtime struggling to keep up with the demand for materials. But even with our best effort, we had the West's fastest vanishing stockpiles."

Geography was another factor echoing the need for expansion. With Phoenix spreading in every direction, both ready mix and aggregate trucks were making frequent trips of more than 30 miles. This was a costly operation both in terms of distance covered and equipment tied up. Because of the distance involved, the single plant was unable to compete successfully in the fast growing Scottsdale and Mesa areas east of town.

The finest source of aggregate in the Phoenix area is the wide, dry bed of the Salt River whose water was diverted far upstream years ago. Its

gravel is rated third hardest in the United States. Union's main plant has been drawing on this source of material for more than 30 years. As the river runs northeast to southwest, they were able to locate both new plants to draw on the same excellent source and still be in the best locations to serve the area's growing needs. The new plant at 59th Ave. is about 9 miles west of the center of the city; the other, near Mesa, about 24 miles east.

Design of the 59th Ave. plant, completed in 1959, was the result of the combined efforts of Union Rock's President Ken Bentson and Phil Williams, general superintendent. It reflects the experience of 30 years' operation at the main plant. The 59th Ave. plant is larger, however, with a designed capacity of 500 tph. compared with the main plant's 400 tph.

The Mesa plant has the advantage of being built hard on the heels of a sister plant, and it carried the process of evolution one step further. It also benefits from the design experience of Guy Clark, who had recently joined the firm as plant engineer.

Few changes have been made, but these have materially added to the Mesa plant's over-all efficiency. The most important changes are an increase from 500 to 600 tph., the addition of a hot mix plant and an arrangement of plant components in two parallel lines.

Wet and dry operations each have a straight-line flow of materials. There is no direct connection between the two. The dry side feeds minus 1½-in. crushed material to a 5,000-ton surge pile from which the washing plant draws its material through a reclaim tunnel. This separation of material flow not only avoids a complete plant shutdown if one section is temporarily out of operation; it also allows independent production of base course material, hot mix aggregate, fill material or concrete aggregate if there is an unusually heavy demand for any one of them.

A 2½-cu. yd. shovel gouges material from the river bed, loading two bottom-dump trucks for the 300-yd. trip to the plant. There it is dumped into a 250-ton, drive-over truck hopper. This large hopper, coupled with a rheostatically controlled automatic feeder with variable-speed motor, makes possible a uniform feed control at any rate be-

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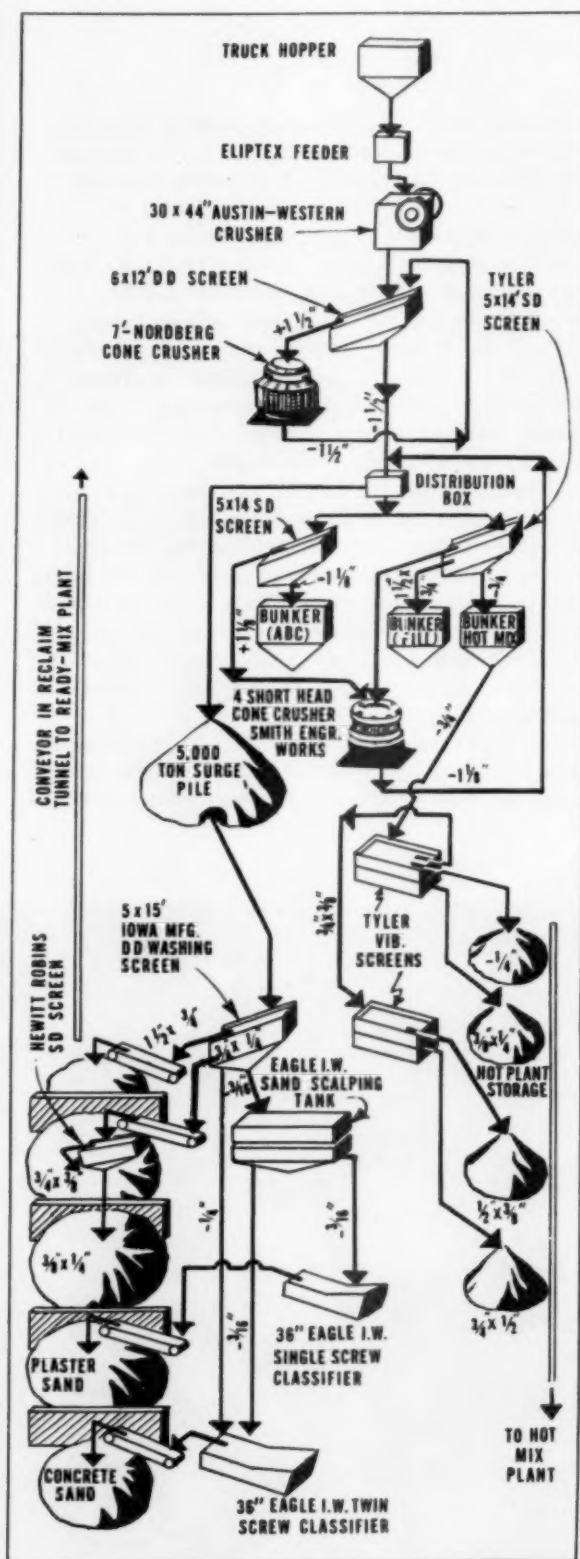
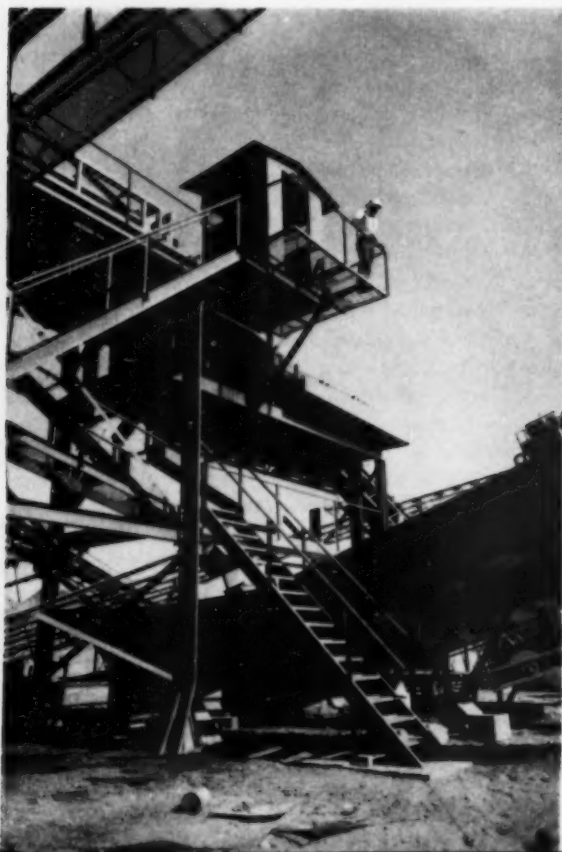


SAND AND GRAVEL flows through Union Rock's Mesa plant from right to left in two parallel streams. The wet side in the foreground prepares concrete aggregates for a ready mix plant going up at the left. The system in back makes four dry aggregates for a hot-mix plant



SECONDARY CRUSHER is a big 7-ft. cone that reduces all plus 1½-in. gravel to be recycled

WET WASHING OPERATIONS are controlled from a pulpit high above the sand-classifying system



UNION ROCK BRACKETS ITS MARKET

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tween 100 and 800 tph. From the primary crusher material flows to a double-deck screen. Oversize from both decks goes to the secondary crusher. The top deck is a plate with $2\frac{1}{2} \times 3$ -in. openings. This prevents a small amount of pancake rock from clogging the $1\frac{1}{2}$ -in. screen below. A similar plate is used on the primary feeder, allowing fines to fall to the belt first.

The minus $1\frac{1}{2}$ -in. material is split, part going to the storage pile supplying the washing section and the remainder to a distribution box. There it is again split and chuted to two single-deck screens mounted over load-out bunkers. One passes minus $1\frac{1}{8}$ -in. base rock, while the other passes minus $\frac{3}{4}$ -in. rock for the hot plant. These are two of five screens mounted over bunkers or storage bins. Their positioning has cut conveyor requirements by several hundred feet.

Oversize from both screens is normally sent to a tertiary crusher and recycled. However, oversize from the $\frac{3}{4}$ -in. screen can be chuted into a third bunker to make $\frac{3}{4} \times 1\frac{1}{2}$ -in. fill rock.

Base course material and fill rock are loaded out directly from these bunkers. Even at peak periods trucks are seldom delayed. A 20-ton truck can be loaded in as little as 15 sec.

The $\frac{3}{4}$ -in. material also can be loaded out, although it is usually conveyed to two more screens mounted over the hot plant storage bins. Both screens have split decks and break it down into four sizes: minus $\frac{1}{4}$, $\frac{3}{8} \times \frac{1}{4}$, $\frac{1}{2} \times \frac{3}{8}$ and $\frac{3}{4} \times \frac{1}{2}$ inches.

Sufficient screen capacity has been provided so that the entire normal flow through this section of the plant can be diverted to preparation of either hot mix aggregate or base course material. This diversion is accomplished simply by stopping one screen and allowing material to back up in the chute from the distribution box. "This is our own design," says Plant Manager Bill Hale, talking about the over-all operation, "and we handled the construction as well as the fabrication of such parts as the conveyors and catwalks with our own crews."

The advantages of straight-line design are obvious. Several hundred feet of conveyor has been saved; less supporting structure was required than might have been necessary with more conventional layouts, and the single operator controlling this section has unrestricted visibility of all operations.

The wet side of the plant features the same straightforward design concepts. Material moves from the surge pile to a double-deck washing screen. Both decks are split. The $1\frac{1}{2} \times \frac{3}{4}$ -in. rock

is conveyed directly to stockpile. A $\frac{3}{4} \times \frac{1}{4}$ -in. fraction is conveyed to a single-deck vibrating screen mounted directly over a storage bin where $\frac{3}{8} \times \frac{1}{4}$ -in. material drops to storage. A short belt moves the $\frac{3}{4} \times \frac{3}{8}$ -in. material to an adjoining bin. Placing this screen over the bin saves at least 200 ft. of conveyor that would be required by more conventional location.

From the lower deck of the washing screen, fine sand (minus $\frac{3}{16}$ -in.) is chuted to a sand scalping tank. The finer fractions are drawn off to a single sand screw for dewatering, while the coarser fractions are drawn into a twin screw. The twin screw also receives $\frac{1}{4} \times \frac{3}{16}$ -in. sand directly from the lower deck of the washing screen. The products of both sand screws are conveyed directly to storage.

The five load-out bunkers for concrete aggregate draw material from the storage bins through a reclaim tunnel, or the operator can divert the materials to go direct to the concrete batch plant. The same straight-line design is used here as was used in the dry side of the plant.

All washing operations are controlled from one console on top of the screening tower. The console is designed so there is no fumbling for buttons to start up or shut down in proper sequence. The operator only has to push buttons from left to right in the first row and repeat the operation in the second row and the plant is underway—and in proper sequence.

All storage bins are equipped with a "dead man" control. Bins fill only as long as the control button is held down. This is a simple method of preventing overflowing of material if an operator's attention is momentarily diverted.

How does the plant stack up in over-all efficiency? If manpower used is any criterion, it's considerably more efficient than either of its predecessors. Eight men are required to operate each of the three of Union Rock's plants. However, the main plant has a capacity of 400 tph., the 59th Ave., 500 tph., while the Mesa plant has a rated capacity of 600 tons.

If awards are ever given for attractive aggregate plants, Union Rock's Mesa plant will be high on the list. Seen from the main road, its bright orange string of components presents a truly striking appearance. "During the tourist season," jokes Guy Clark, "so many vacationing aggregate producers stopped by to look at the plant we were thinking of charging admission."

With its third plant in operation and a total

Please turn to page 144



Their aim: to double production without increasing overall loading costs. Solution: this 4 1/2 yd Michigan Tractor Shovel. Its regular time-record:

60 SECONDS TO LOAD

At the Oneglia & Gervasini pit near Woodbury, Connecticut, they are loading trucks in *half the time* it ever took before!

Overall loading *costs*, nevertheless, have stayed practically the same!

Reason for this production-doubling, cost-cutting record is the 4 1/2 yard Model 275A Michigan Tractor Shovel shown on these pages. This unit has *1 1/2 times the bucket capacity* of the most commonly-used size of mobile Tractor Shovel. Its speed of loading has been remarkable . . .

**Heaps small trucks in 20 seconds,
20 yard semi-trailers in 2 minutes**

Working mostly with 10 yard, 10 wheel trucks in this 1,000-ton-per-day traprock quarry, the Model 275A has established an average load cycle of only 60 to 70 seconds —from first pass into a stockpile 'til loaded truck pulls away. "On our busy days," reports Supt Theodore Tietz, "we move 10-yard trucks out of our pit at the rate of one per min-

ute." Smaller trucks generally require only 20 to 30 seconds (one pass) to load. Twenty to 24 yard semi-trailers usually take 2 to 2 1/2 minutes (four or five passes). These records cover two years of operation and all grades of crushed stone, all kinds of weather. In one typical time-and-motion study, for example, the Model 275A regularly dug into a half-frozen stockpile of 1 1/2 inch stone and backed off with a heaping 4 1/2 yard payload *in only 7 seconds!*

Carries 5 ton load up 35° slope

High-speed loading like this has been *only one* of Michigan's important achievements. The 262 hp rig has taken over some tough stockpiling chores too. Like moving two-inch stone to the top of a 100 ft high stockpile. The last 60 feet of ramp to piletop here is pitched at a 35-degree angle—yet the Michigan regularly carries a heaping 5 ton load up it. Back-dragging on the return trip accurately spreads and compacts a 4 to 5 inch layer of gravel to keep the ramp graded for continuous dumping.



"I particularly like Michigan's bucket action. Even in frozen stone, you can push in and get a full load without straining"—Operator Bob Faccin.

SPECIFICATIONS

	Model 275A	Model 375A
Bucket capacity (standard SAE ratings)	4½ yards	6 yards
Lifting capacity	22,000 lbs	30,000 lbs
Weight	46,000 lbs	61,000 lbs
Speeds (forward and reverse)	0-28 mph	0-25 mph
Seven other standard Michigan Tractor Shovel models, 16 cubic feet to 2½ cubic yards (SAE bucket ratings), are available.		

"This big Michigan effectively dresses stone stockpiles. Its 10'8" wide bucket makes it an excellent snow plow. It even does well on such tough dozer jobs as shovel cleanup and stripping quarry top prior to drilling"—Supt Theodore Tietz.



EACH 10 YARD TRUCK

Moves 11 ton boulders

Michigan handles "super-lifting" assignments too that smaller Tractor Shovels couldn't touch. Rip-rap, for example. Some of the traprock boulders uncovered in the Oneglia-Gervasini pit weigh 10 or 11 tons! The Michigan makes short work of stockpiling or loading them into trucks. "In fact," says Supt Tietz, "the Michigan frequently in the past 2 years has moved rocks our quarry shovel couldn't handle!"

Model 275A easy to maintain

One reason O & G's Michigan performs so well on all these tough jobs is its all-Clark power train . . . Clark torque converter, power-shift transmission and planetary wheel drive axles . . . all matched to each other . . . all designed to the same general specifications as the Clark components which have proved so efficient in the 15,000 smaller Michigan Tractor Shovels sold since their introduction in 1954. Also, some credit for Michigan's good performance here should be given the simple, systematic maintenance procedure fol-

lowed. About half an hour a day takes care of lubrication as well as oil, water and torque converter oil check. Once a week engine oil and air filters are changed. "It's an easy machine to service," says Operator Bob Faccin, "and we feel the time is well spent."

If you load trucks, we honestly believe *your* time will be well spent on a study of the big Michigans. Both the 4½ yard Model 275A, described here, and the bigger 6 yard Model 375A are now proved by over two years in the field. Both are in regular production and readily available. See your local Michigan Distributor for details on performance . . . price . . . and delivery!

CLARK
EQUIPMENT

Michigan is a registered trade-mark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2481 Pipstone Road
Benton Harbor 27, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario



At pug mill, Michigan Dozer moves 550 tons hourly up to 150 feet.

Major Southern quarry chooses Michigan Tractor Dozer for top-production job

375 hp model feeds 550 tons hourly to pug mill



Same unit also handles shovel and blast cleanup in pit ½ mile from mill.

At its top rate, this Michigan Tractor Dozer moves 550 tons of crushed stone an hour!

Pushes, one-way, range up to 150 feet.

Same unit also cleans spillage around two rock shovels located ½ mile away.

It alone does the work of two 50,000 lb class crawler dozers.

**Owner: Lambert Brothers
Division of Vulcan Materials**

The Dozer is a 375 hp, 74,000 lb Model 380 Michigan. It is owned by Lambert Brothers Division of Vulcan Materials Inc, Birmingham, Alabama, one of the nation's largest stone pro-



**New Michigan Tractor Shovel,
latest of 15 owned by Lambert,
truck-loads 3,500 tons daily**

One of Lambert Bros 15 Michigan Tractor Shovels. This unit, a new Model 175A with $3\frac{1}{4}$ yd bucket, handles all truck-loading, also dresses stockpiles in Lambert's Nashville quarry. It loads 200 to 250 trucks, 3,000 to 3,500 tons per 8-hour day. Each pass—2700 lb/yd $3''$ stone down to -100 filler dust—averages 4 tons, each load cycle takes 20 to 30 seconds. Unit works out of 25 stockpiles, scattered over 100 acres. Furthest run is $\frac{1}{4}$ mile—easy for the Model 175A's fast rubber-tired speed of 27 mph.

ducers. The Lambert Division alone operates 25 quarries in Tennessee, North Carolina, Kentucky, and Virginia; they are using this Dozer in their 80 acre pit near Nashville.

The story starts last summer. Harold and Glen Lambert had just installed the pug mill and needed something to feed it. Their existing crawler dozer wouldn't do; it obviously didn't have the mobility to do both pit cleanup and mill feeding. Another big crawler would be needed, it seemed. Then Nashville distributor McCarthy, Jones & Woodard suggested a rubber-tired Michigan Tractor Dozer. One was tried. The problem was solved. From four available sizes, a 375 hp model was

chosen as best suited to the need (the other size Michigan Dozers: 162, 262, and 600 hp).

**Main jobs: feed mill,
clean around shovels**

The 375 hp machine has been busy ever since.

Most of the time it works at the pug mill—dozing out into a stockpile from the feeder belt when the mill isn't running—feeding when the mill is running at a higher rate than available plant production (half or more of the crushed rock is fed into trucks and hauled to regular stockpiles).

Four to eight times a day, the 25 mph Michigan leaves the mill and drives

down blacktopped roads to the quarry for shovel cleanup. Unit makes the $\frac{1}{4}$ mile trip, which took crawlers 20 minutes or so one-way, in 2 to 3 minutes.

**50% cut in shovel
cleanup time**

In the pit, the Michigan saves more time (and money). Back in Lambert Brothers crawler days, a good operator could clean the spillage around one shovel in 5 or 6 minutes. Today, their high-speed Michigan does each cleanup in 2 to 3 minutes.

**50% cut in blast
cleanup time**

Another example of time saved is in blast cleanup. Once or twice a week, Lambert's crew shoots the 90 ft high quarry face. Each blast breaks about 22,000 tons of limestone, throws some rock as far as 600 ft. Used to take a crawler 45 minutes to an hour of full-time work to police the area. Now, the Michigan Tractor Dozer cleans up in 20 to 30 minutes.

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CLIFFORD OVIATT

At the annual meeting of the National Ready Mixed Concrete Association in Chicago in February, 1960, one of the featured speakers was Clifford R. Oviatt, Stamford, Conn., attorney. He described the workings of the Connecticut Ready Mixed Concrete Association which he and his colleague, Carleton Connor, were instrumental in organizing. Mr. Oviatt's appearance was in line with long and persistent efforts on the part of Vincent P. Ahearn, executive secretary of NRMCA, to appraise the ready mix industry of the benefits of group bargaining. ROCK PRODUCTS wishes to acknowledge the guidance and assistance offered by Mr. Ahearn in the preparation of this article—the third in ROCK PRODUCTS' series on labor problems and solutions in the rock industries.

CARLETON CONNOR



How to bargain as a group-- the Connecticut way

by the Editors of ROCK PRODUCTS

THREE YEARS AGO, four concrete producers called at the offices of the Stamford, Conn., law firm of Cummings & Lockwood to see two young, alert attorneys named Carleton Connor and Clifford (Dick) Oviatt. Their purpose: to seek a way out of growingly complex labor problems that were devouring more and more time, requiring increasing amounts of specialized handling and advice and costing steadily more money. The producers were faced with a shortage of all three—and they were earnestly seeking an answer, not only on behalf of themselves but all the concrete producers in the state of Connecticut.

The outgrowth of that meeting—and many other exploratory sessions that followed—was a unique organization called the Connecticut Ready Mixed Concrete Association. The success of this organization—the only statewide bargaining organization in the rock industries as far as we've been able to discover—and the simplicity of its structure merit close attention by rock producers all over the nation. The Connecticut plan might well offer the answer to one of the most vexing problems faced today by rock products operators: how to deal on a reasonably equitable basis with organized labor.

Most of the Connecticut producers had long been

Part 3 of Rock Products' Labor Series: The Connecticut plan might well offer the answer to one of the most vexing problems faced today by rock products operators—how to deal on a reasonably equitable basis with organized labor

part of a much larger statewide organization of road builders, in which they felt their particular problems and interests were submerged. All of the large ready-mixed concrete companies had expressed interest in breaking away from the road builder group to form their own bargaining organization. When Connor and Oviatt agreed to act as spokesmen for the Connecticut ready mix industry, the founding producers set out to solicit additional members.

Twenty-three companies joined the group before the first union negotiations took place; today the Association has 32 members (five are still non-union) representing about 80 percent of all concrete producers in the state of Connecticut. It should be emphasized that although this group includes only ready mix operators, the principles under which they have banded together are applicable to all the rock industries anywhere in the nation.

The Connecticut Association has negotiated one statewide labor contract, with a new one coming up in 1962. The Association was formed in 1957 so producers could negotiate as a group when their labor contract expired April 30, 1958.

Prior to bargaining with the union, Connor and Oviatt toured the state, explaining the Association to its newly recruited members. They then invited agents of all the union locals involved with the ready mix industry in Connecticut to a meeting. There, the lawyers told the union representatives about the formation of the Association, explained its workings and offered to answer any questions.

"We didn't want to throw this at them at the last minute, just before negotiations started," explained Oviatt. "They had a right to know what was going on. They were a little dubious at first, but finally accepted the Association in reasonably good grace and formed a joint committee of their own to negotiate with us."

Once the Association was established in the minds of the union negotiators, a committee was selected by Association members to sit in on the actual bargaining sessions. This group queried individual members for proposed contract changes. These changes were discussed by the group, some discarded and some retained for bargaining. The two attorneys and the five-man Association negotiating committee were then ready to sit down

with the union representatives to write a new contract.

One colossal pre-negotiation stumbling block was encountered that merits special mention. There was a wide variation in the hourly labor rate paid men in upstate Connecticut as opposed to the localities near the New York metropolitan center, as well as other differences in holidays, vacations and fringe benefits. Throwing in with the group meant the upstate producers would be forced to pay an hourly rate considerably above what they might otherwise have gotten off for. (There was an hourly gap of about 15¢ between the highest and lowest producers in 1958.) The upstate producers were persuaded to go along on the basis of four principal arguments:

- Uniform wage scales were coming anyway; it would be to the benefit of the producers to take the initiative in this direction through the Association and use this as a strong bargaining point.

- Strength of concerted action by producers had been found legally sound as a result of the Supreme Court ruling in the Buffalo Lines case—which upheld the principle that a strike against one member of a bargaining association could be legally construed as a strike against the entire group.

- Through the Association, individual members would know exact labor costs in competing companies.

- Group negotiations would save the individual producer a great deal of time, grief and the possible necessity for hiring expert outside help.

The fact that a number of Connecticut producers were actually willing to raise wages considerably higher than would have been necessary at that time is a most remarkable tribute to the attractiveness of the Association idea in general—and the Connecticut group in particular.

Negotiations in Connecticut in 1958 lasted about six weeks. Although a strike was threatened several times, it never came off and the producers were able to hold the line at a number of points that would unquestionably have buckled in individual negotiations. During the bargaining period, the negotiators reported back to the full producers' group three times and to the Association's Board of Directors after virtually every session.

Please turn page

HOW TO BARGAIN AS A GROUP—THE CONNECTICUT WAY

continued from page 111

Although the producers were far from unanimous about where and how much to give, the majority decision prevailed and the entire group abided by it—albeit some grudgingly. A three-year contract was signed in March, 1958. This agreement was subsequently extended for another year so that it now expires in April of 1962. Association officials expect the negotiations coming up in the Spring of 1962 to be tough. But they are fully confident of their ability to meet whatever situation may arise—with unity of action.

"An organization like this is badly needed," says Dick Oviatt, "wherever the industry doesn't speak as a group. The size or shape of the geographic area isn't important. Some sort of grouping usually suggests itself in every locality. The important thing is that there be a potent voice for the industry—and this means group action unless, of course, one company is so powerful it can perform the same function alone. Unless the industry unites in this fashion, the unions will whipsaw individual companies to ribbons—by working against the weakest producers and jamming these concessions down the throats of all the others."

How do rock producers go about forming a cooperative bargaining group—similar to the Connecticut Association—that can operate effectively? Dick Oviatt suggests six essential steps:

1. The largest and most powerful companies in an area must want such an organization. The impetus must come from them. Without them, the organization cannot be effective because it can't put forth a sufficiently united front.

2. Once the larger companies—or at least several key companies—have decided to launch a group enterprise, they should solicit smaller companies to determine how many will go along with the group. Sometimes this takes a real selling job. Founding companies should have their arguments well in hand and be prepared to answer all the stock objections that will be raised. If 75 to 80 percent of the total production in an area can be enlisted behind the organization, it is ready for business.

3. The group must then obtain a spokesman. Says Oviatt: "He should be a fairly strong personality with no axes to grind or conflicting interests to complicate his job. He should be wholeheartedly behind the purposes and aims of the Association and should be given the necessary authority to act effectively. He should have some background in labor problems, should know the labor people with whom he'll be dealing and should be trusted by

them." Oviatt understandably feels that a lawyer probably best fills all of these qualifications.

4. The spokesman must be educated, in detail, to the specific problems, aims and weaknesses of the industry and the Association. Nothing should be held back from him. This should be done by a committee of producers representing all the interests in the group.

5. The group should then elect a Board of Directors which, in turn, will appoint a negotiating committee to represent the producers—along with the Association spokesman—at union bargaining sessions. The directors should define the powers of this negotiating committee and specify the procedures it is to follow, e.g., when to report back to the whole group, etc. Beyond these specific restrictions, the negotiating committee should be permitted to carry the ball. The committee should have one spokesman at negotiations, and everything should be cleared through him.

6. The entire producers' group must have faith in its Board of Directors and negotiating committee and permit these groups to function without stifling handicaps. This means a minimum amount of second guessing. "When the committee reports back that this is the best deal they can make," says Oviatt, "the large group must have enough faith in their own representatives to believe them. The producers must select men in whom they have confidence."

After three years of experience in working with a producers' bargaining group, what would Oviatt single out as the major stumbling blocks for such an organization, and what suggestions would he make for overcoming these problems? Here is a list of "do's" and "don't's" drawn from the experience of the Connecticut producers:

- Make it clear to individual members that they shouldn't communicate with any union on wages. In a stalemate, or even as a matter of course, unions will try to split a bargaining group by approaching individual members. This should not be permitted to happen; feelers simply should be referred to the Association.

- When negotiations are finished—hopefully, for a long period of time—the Association should be permitted to concentrate its attention in some other area. Oviatt emphasized this point: It is essential that the Association be held together during off-negotiation periods. This can be done by assigning other duties to the Association staff men—such as representing industry interests at the

Please turn to page 144

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*Enacted years ago to insure minimum wages on government jobs,
this law now is being criticized for permitting
inflationary wage fixing*

Davis-Bacon Act has too much “give”

by Eugene Keeney*

THE DAVIS-BACON ACT that has lasted for almost 30 years is causing increasing headaches for contractors and the building industry. It is now unnecessary. It should be repealed.

What does the law state? In brief, it requires every employer who is a party to a government contract over \$2,000 for “construction, alteration or repair, including painting and decorating” of public works or public buildings, to pay the prevailing wage rate at the town or other locality to each classification of “laborers and mechanics” who work under that contract. The Secretary of Labor is given the tremendous power of determining the prevailing local rates.

Originally, the Davis-Bacon Act was intended to prevent disruption of local wage practices by importation of low-priced labor. Now it is used to disrupt local wage practices by importation of higher wage rates from other areas.

Recently, Labor Department officers set rates for airport construction work at the Hastings, Neb., airport. These rates soared above normal wages for Hastings. Bulldozer operators were given \$2.80 an hour while the Hastings’ rate was \$1.75, and metal pipe layers \$2.30 an hour instead of the Hastings’ rate of \$1.60. Only after a group of Nebraska contractors protested this inflationary wage fixing determination by the Labor Department, did the Department reduce its deter-

mination to \$1.75 for bulldozer operators and \$1.45 for pipe layers.

In 1956 the Federal Highway Act became law and the Davis-Bacon Act was incorporated in its requirements. Proposed legislation to provide federal aid for school construction also contains an extension of Davis-Bacon Act to this program.

Recently a survey was conducted by a high Chamber of Commerce official who contacted all state highway commissions asking whether the Labor Department’s fixing of minimum wage rates for interstate highways had increased construction costs. He got replies from 40 states. This was the result: 7 did not know whether Davis-Bacon has raised costs; 15 said the law had little effect; 18 reported that Davis-Bacon was a definite factor in increasing construction costs.

The Davis-Bacon Act vests absolute administrative power in the Labor Secretary. As shown in many cases the rates set by the Labor Department are higher than local wages. The net result of Davis-Bacon is to put union wage rates into all government construction contracts, even in rural areas where there are no unions.

High rates are set despite the specific requirement in the law to set rates prevailing “in the city, town, village or other civil subdivision” in which the work is to be performed. Flaunting of the law is justified by the “source of labor supply” principle. It is argued that in order to attract labor from metropolitan areas to work on the project, it is imperative that rates established by the unions in such areas be recognized. This approach, however, ignores the fact that the purpose of the Davis-Bacon Act is only to provide minimum wages. The act permits contractors to pay rates higher than the minimum wherever necessary.

A power that transcends all of this is the Labor Department’s absolute right to blacklist the contractor who does not conform to wage determination interpretations and directives of the Labor Department.

In conclusion, by increasing costs the Davis-Bacon Act slows America’s growth. The danger of contractors bringing cheap labor into communities no longer exists. The long-run goal must be absolute repeal of the law. In the short run, there is need for judicial review of the wage determinations of the Secretary of Labor. His power to set wages and then blacklist contractors who cannot conform should be curbed.

END

*Mr. Keeney, an attorney on the staff of the Chamber of Commerce of the United States, serves as secretary to the Special Committee on the Walsh-Healey and Davis-Bacon Acts. He is also editor of the National Chamber’s Monthly Labor Case Digest. A graduate of New York University, he is a member of the New York and District of Columbia bars. Mr. Keeney is also Professor of Business Administration at Southeastern University, Washington, D.C.



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POWER FOR A GROWING WORLD



Here's the best way to avoid conveyor breakdowns

by J. R. Brandon*

NEEED AN RX TO KEEP YOUR BELT CONVEYORS in top condition? Here's the best professional advice available: Keep them scrupulously clean and inspect them daily for defects. Longer life and better performance will repay your effort, and breakdowns will occur infrequently, if ever. Preventive maintenance, like preventive medicine, is worth the cost. It does, in fact, put money in your pocket.

Good housekeeping is vital to proper belt conveyor maintenance. This doesn't mean cleaning up a conveyor line once a month or every two months—it means maintaining a clean conveyor system at all times.

Along with the good housekeeping regimen, a regular daily and weekly inspection schedule is a must. The patrolman on the conveyor system should be responsible for making quick examinations each day, so that any danger spots can be reported immediately and the conveyor shut down for emergency repairs. Weekly inspections should be made by a foreman. He also should make a more detailed quarterly inspection and submit an inspection report to the maintenance superintendent, whose responsibility it should be to have corrections made.

As a starter, the following points can be used as a daily checklist. Additional ones may occur to you to fit your particular situation.

Belts: (a) Watch for conditions which can cause spillage of material onto the return strand where it can get between belt and pulleys.

(b) See that the belt is properly trained and does not contact steel structure. This is especially important on the return run which often receives less attention since it is less obvious.

(c) Breaks, both in cover or carcass, gouges or worn spots should be marked and reported for early repair.

Idlers and pulleys: (a) Note and mark "frozen" or damaged idlers for repair or replacement.

(b) Check troughing training and return training idlers for proper operation.

(c) Check the scrapers and the plows for proper operation.

(d) See that material is not built up on decking or floor under idlers or pulleys (especially important at training idlers).

* (e) Watch for and eliminate material built up on idlers or pulleys.

(f) Inspect grease seals to make sure they are not leaking excessive grease that may damage costly belts.

Chutes and hoppers: (a) Note and correct conditions which can cause clogged material.

(b) Prevent large lumps from dropping directly on an unprotected belt.

(c) See that material feed is centered on belt and that belt is not overloaded.

Lubrication should conform to schedule, too. You will have to determine what schedule will give the most satisfactory performance. Lubrication shouldn't be done too often, though. Tests and examinations of idlers in the field showed a tendency toward too frequent lubrication, with the result that grease leakage through the seals becomes excessive. I found that idlers lubricated with the proper type of grease need be relubricated only after 4,000 hr. of operation, under normal service conditions.

Of course, service conditions vary considerably. Areas around loading transfer or discharge points sometimes are extremely dusty, depending on the material handled. In such cases lubrication must be more frequent. Frequency can be determined only by experience with existing conditions. If you have any doubt about proper lubrication inter-

Please turn page

*Service Manager, Hewitt-Robins Inc., Stamford, Conn.



LEFT: Floors and areas surrounding conveyors should be cleaned regularly



ABOVE: Pile-up of material around idlers reduces efficiency and causes excessive wear



RIGHT: Proper design and installation are essential if conveyor life is to be realized



LEFT: Example of a conveyor system properly designed and maintained



ABOVE: Belts should be properly trained and kept away from contact with steel structure



RIGHT: Skirtboards should be used to confine material to the center of belt at loading points

HERE'S THE BEST WAY TO AVOID CONVEYOR BREAKDOWNS

continued from page 117

vals, this is the best way to check: Select a representative idler and disassemble it after a period of operation to observe the condition of bearings and seals and the amount and quality of lubricant remaining in the bearing chambers.

In selecting your lubricant for idlers and other conveyor machinery components, there are a number of factors to consider. Experience over many years has shown that abrasion of the rollers and raceways is the major cause of bearing failure in idler rolls. It never is due to fatigue of the metal, which often is the ultimate cause of failure in more general bearing applications.

The major requirements for an idler lubricant, therefore, are: It should resist leakage through the grease and dust seals, and it should protect against corrosion. Tests of hundreds of greases in idlers under actual operating conditions have shown a marked difference in the ability of the grease to be retained in the bearing housings without leaking through the seals.

Analysis of the test results shows, surprisingly, that the less expensive calcium-base cup greases of No. 2 consistency are generally more satisfactory than the higher-priced ball and roller bearing greases. The water-resisting properties of the calcium-base greases also are valuable, since wet conditions are present in many belt conveyor applications in the rock products industry.

A few comments in regard to correct design, which is a very essential preliminary to subsequent ease of maintenance, may be apropos here. So, if you are planning to add to your conveyor system, here are some points to watch for:

Be sure the feed chute discharges gently and as near belt speed as possible, because the principal impact and abrasive wear on a conveyor belt occurs at the loading point. If the material contains large abrasive lumps, feed some fines to the belt first to cushion the impact of the large heavy pieces. Notching the mouth of the chute or the use of a screen in the chute are excellent ways to accomplish this objective.

Impact idlers should be used to cushion the fall of large, heavy lumps fed directly to a belt and will extend its life appreciably.

See that proper clearance is maintained between the belt and the bottom and tip of the chute to prevent any scraping contact. Trapped lumps also do much damage if the material being conveyed should become wedged between the belt and chute or other parts of the conveyor structure. Brushes

or scrapers can be used to help prevent sticky material from becoming trapped between belt and pulleys.

Belt tension should be just enough to keep the belt from slipping on the drive pulley and to minimize sagging between idlers. Too much tension is injurious and may result from improper maintenance of idlers or pulleys, excessive tightening of take-up screws, too much weight on a gravity take-up, temperature changes, loading of the belt beyond original calculations or shrinkage of the belt from exposure to moisture.

Where sufficient room exists, automatic take-ups, properly weighted, ordinarily will pay for themselves in compensating for changed conditions without the necessity of constant manual readjustment.

Skirtboards should always be used to confine material to the center of the belt at the loading point. These can be made of wood or steel, but the skirtboards themselves should not come closer to the belt than 2 or 3 in. The remaining gap should be bridged by fastening rubber to the skirtboards and allowing it to extend onto the belt. Don't use old belting for skirtboard or scraper rubber, since the carcass provides too much rigidity and will wear grooves in the main belt.

In addition, fines will become trapped in the carcass and act as an abrasive. Specially-designed skirtboard and scraper rubber is available and should be utilized. Skirtboards should be installed so that they taper outward and lift slightly off the belt in the direction of travel.

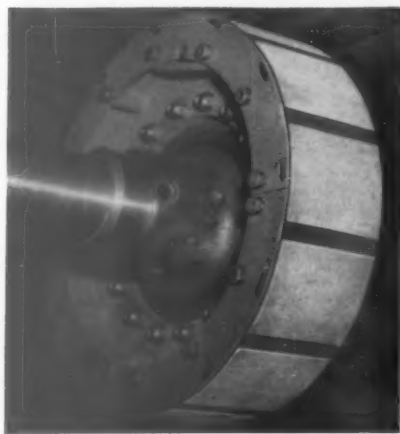
Additional belt cleaning aids may be necessary. Built-up material on return idlers sometimes causes the belt to run off-center. The presence of this material usually means that additional belt cleaning, in the form of scrapers or water sprays and squeegees, is needed. Some materials, due to their adhesive nature, can't be satisfactorily cleaned or scraped from the belt. In such cases the use of rubber disc idlers, or rubber sleeves installed over standard idlers, may be necessary on the return run of the conveyor.

Belt conveyors, when designed properly, installed carefully, cleaned and inspected regularly, are a highly efficient and relatively trouble-free method of handling material. Otherwise, like all machinery, they can be an endless source of trouble. Follow procedures that have been demonstrated by experience to be sound, and you can have a smooth-running operation. Where conveyor breakdowns are concerned, an ounce of prevention is, indeed, worth a pound of cure.

END

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ROCK PRODUCTS, August, 1960

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119

*Here's a way to check separation equipment
to meet the coming challenges
for precise gradation*

Are
your screens
really
efficient?

by Karl Hauser

AT A TIME WHEN SCIENCE IS PENETRATING the secrets of the atom, we tend to go by "rule of thumb" in selection of a piece of classifying or screening equipment. Our technology probes the mysteries of the universe with complex devices, yet we have trouble evaluating the performance of a classifier installation. It is not unusual for selection and application to be based on factors other than technical criteria.

Part of this difficulty arises from the fact that it is almost impossible for the average purchaser to prepare a specification for the desired performance of a screen or classifier. This makes it difficult for the manufacturer to guarantee satisfactory performance without a comfortable margin of overdesign. After equipment is operating, its performance cannot be analyzed accurately because sampling techniques are vague and troublesome; the actual measurement of tonnages or rates per unit of time is an almost insurmountable task. The only practical way is to sample the various streams of in-process materials and analyze them qualitatively to study the system.

There is a little-used formula for finding the efficiency of such equipment from sample analyses, and we will go through its derivation so that you may understand its application. First, however, I must emphasize for a point of comparison how inadequate our present practices are. Now, when

we wish to determine the efficiency of classifying operations, we usually rely on the percentage of recovery of desired fractions. This applies particularly to screening equipment, but it also has been applied throughout the entire separation and concentration field.

Even in screening operations, measurement of percentage of recovery has doubtful value, especially if the screen is worn. As it wears, the percentage of recovery goes up, although the actual separation efficiency at the specified mesh goes down. For example, when the screen has a big hole in it, the recovery of the desired fraction could be 100 percent—but the actual efficiency is zero.

The formula I mentioned eliminates this shortcoming and is applicable to any classifying function, regardless of type. It is based on the premise that separation efficiency is shown in the ratio of weight of materials that are actually classified in both rejected and beneficiated streams, to the total weight of all products.

The term, "actually classified," needs definition. For purposes of clarity, I will use the example of a size-separation process, although the same relationship will hold also for processes aimed at chemical or physical separation, or on any basis besides that of size. In the coarse stream of a screen, there may be some material finer than the desired size. This material, plus a weight of the coarse fraction relative to it in the same proportion as in the original feed, constitutes the unclassified portion.

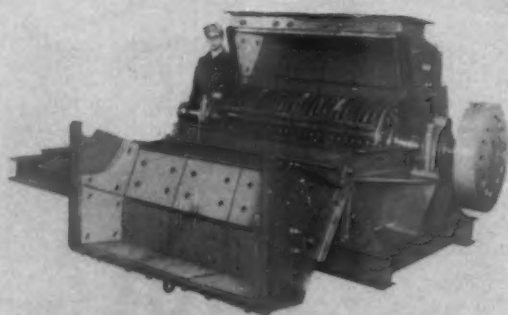
The rest of the coarse stream is actually classified. In the fines stream, there may be some material coarser than desired. This material, plus an amount of fines relative to it in the same proportion as in the original feed, is the unclassified part of the fines stream. The balance of the fines stream is actually classified. The ratio of the total of actually classified materials in fine and coarse streams to the total materials of both streams (or total new feed) is the gauge to the efficiency of the separation.

We assume for the purpose of this example, in developing the formula, that the beneficiated material containing the desired product is the fines stream. The derivation of the formula is:

Feed = $\frac{A}{B}$ weight per unit time, at a decimal fraction of desired material. Please turn to page 122

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It's another Williams "first"—features not available in other hammer mills—that now makes it possible to maintain the original close clearances of *both* grinding plates *AND* cage sections against the rotating hammers. This easy-to-make "2-point" adjustment, in the most critical grinding area inside the hammer mill, gives absolute assurance of consistently uniform product quality.

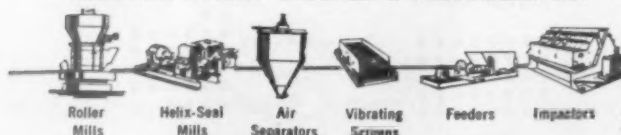
In addition to the advantages of the Dual "2-Point" Adjustment, a Williams Reversible Hammer Mill substantially lowers upkeep expense by

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ARE YOUR SCREENS REALLY EFFICIENT?

continued from page 120

TABLE I

	Feed	Tails stream	Beneficiated stream	Efficiency
Air separator				
Cement raw mix				
Percent under 100 mesh	50.0	25.0	90.0	61.5
Screen				
Limestone crushing				
Percent under 1/2 inch	40.0	2.0	100.0	97.0
Screw classifier				
Desliming				
Percent over 100 mesh	80.0	14.0	96.0	80.0
Thickener				
Dewatering				
Percent of solids	10.0	0	66.0	94.5
Concentrator				
Metals recovery				
Percent of desired metal	0.956	0.10	21.5	86.2

Tails = $\frac{B}{a}$ weight per unit time, at $\frac{b}{a}$ decimal fraction of desired material.

Fines = $\frac{C}{a}$ weight per unit time, at $\frac{c}{a}$ decimal fraction of desired material.

Material balance equations for the system are:

$$(1) A = B + C$$

$$(2) aA = bB + cC$$

Unclassified material in tails = weight of desired product not removed from tails, plus an amount of tails relative to it in the same relation as in the new feed.

$$= bB + bB \frac{(1-a)}{a}$$

$$(3) = \frac{bB}{a}$$

Unclassified material in fines = weight of undesired product in the fines, plus an amount of fines relative to it in the same relation as in the new feed.

$$= (1-c)C + (1-c) \frac{C(a)}{(1-a)}$$

$$(4) = \frac{C(1-c)}{(1-a)}$$

Classified material in tails = $B - \frac{bB}{a}$ (total tails less unclassified)

$$(5) = \frac{B}{a} (a-b)$$

Classified material in fines = $C - \frac{C(1-c)}{(1-a)}$ (total fines less unclassified)

$$(6) = \frac{C(c-a)}{(1-a)}$$

Percentage of efficiency = (classified material in tails + classified material in fines) ÷ (total material)

$$(7) \text{ Percentage of efficiency}$$

$$= \frac{\frac{B}{a} (a-b) + \frac{C(c-a)}{(1-a)}}{B + C} \times 100$$

(8) Percentage of efficiency

$$= \frac{\frac{B(a-b)(1-a) + C(c-a)(a)}{a(1-a)}}{B + C} \times 100$$

From equations (1) and (2), we determine that

$$B = C \frac{(c-a)}{(a-b)}$$

Substituting for B in equation (8), we get:

(9) Efficiency

$$= \frac{\frac{C(c-a)(a-b)(1-a)}{(a-b)} + C(c-a)(a)}{a(1-a)} \times 100$$

$$C + C \frac{(c-a)}{(a-b)}$$

$$= \frac{\frac{C(c-a) - C(c-a)(a) + C(c-a)(a)}{a(1-a)}}{\frac{C(a-b) + C(c-a)}{a-b}} \times 100$$

$$= \frac{\frac{C(c-a)}{a(1-a)}}{\frac{C(c-b)}{a-b}} \times 100$$

$$(10) \text{ Efficiency} = \frac{(a-b)(c-a)}{a(c-b)(1-a)} \times 100$$

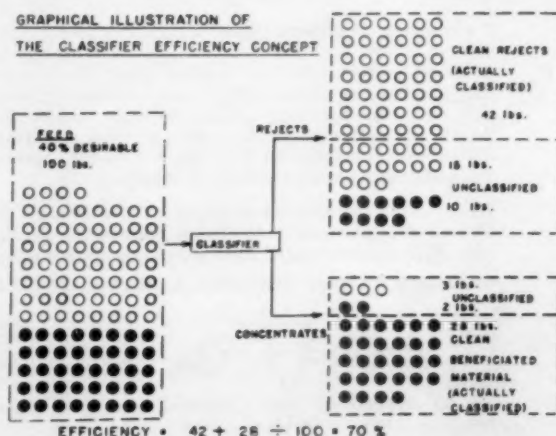
The modified form of this equation, in which percentage is used, rather than decimal fraction:

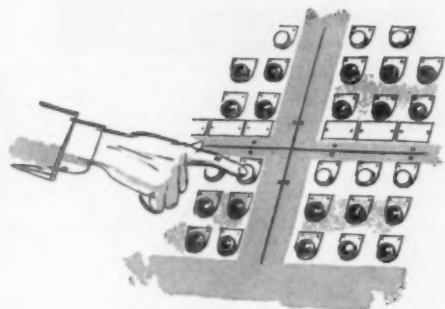
(10a) Percentage of efficiency

$$= \frac{(a-b)(c-a)}{a(c-b)(100-a)} \times 10,000$$

Please turn to page 136

GRAPHICAL ILLUSTRATION OF THE CLASSIFIER EFFICIENCY CONCEPT





Fingertip control with

JEFFREY VIBRATING FEEDERS

...one man runs stone reclaiming operations, screening and washing plant, secondary crushers



Get details on how Jeffrey vibrating equipment and controls can simplify your materials handling job and save you money.

Write for Catalog 930. The Jeffrey Manufacturing Company, 935 North Fourth Street, Columbus 16, Ohio.

THIS quarry produces both high calcium limestone and dolomite products. From a strictly operating standpoint, one man at a Jeffrey-designed control panel runs the screening and washing plant, two secondary crushers and reclaiming operations monitored by 15 Jeffrey vibrating feeders.

Jeffrey feeders under primary surge piles feed stone to the plant via reclaiming tunnel belt conveyor. Vibrating grizzlies with bars on 3" centers allow fine material to fall to belt conveyors ahead of coarser stone, insuring longer life for the belt.

Jeffrey vibrating feeders were also selected for reclaiming finished stone from stockpiles. At these feeders, flow of stone actuates a swing baffle which signals control panel operator that material is flowing properly. Even blends of stone can be obtained by regulating flow from stockpiles to reclaiming belt ... through remote-controlled Jeffrey vibrating feeders.

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ROCK PRODUCTS, August, 1960

123

*Here is a simple way to reduce the radiation losses
from the shell of a rotary kiln, especially
from the burning and calcining zones*

How to reduce radiation losses

by D. A. Wadia*

RADIATION LOSSES from the shell of a rotary kiln, especially from the burning and calcining zones, greatly affect its thermal efficiency. Here is a simple way to reduce these losses: by blowing hot air nearly the temperature of the kiln shell through the space between the kiln shell and an outer stationary, insulated casing. In this way the temperature difference between the shell and surrounding atmosphere is nearly zero, and radiation losses are negligible. Waste heat which might be wasted otherwise could be used as a source of hot air, with a saving of 1 percent or more fuel.

As early as 1932, G. Martin showed that heat losses due to shell radiation largely account for the

poor thermal efficiency of rotary kilns. For example, Martin estimated an average external radiation loss of 400 k.cal. per kg. of clinker.

This is a loss corresponding to about 5.5 percent of coal rated at 7,000 cal. per g. By considering the loss in output and lower burning zone temperatures, Martin estimates the real loss as nearer 15 percent coal.

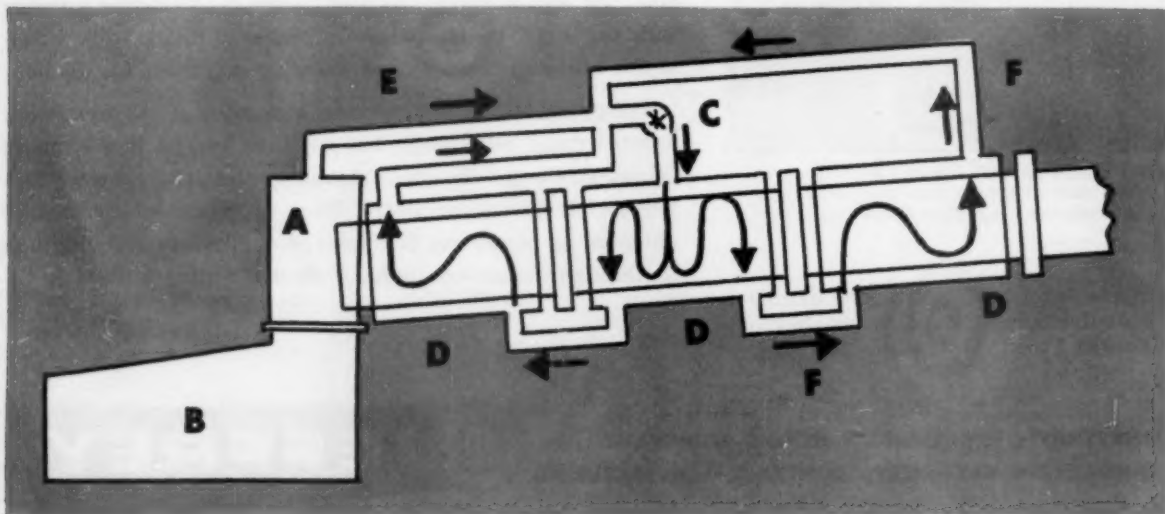
For a wet process kiln whose heat consumption is 1,451 k.cal. per kg. of clinker, H. Gygi in 1952 estimated total radiation loss, including that of the cooler, as 224 k.cal. per kg. of clinker, or about 3.2 percent coal.

Shell radiation and convection losses from the burning and calcining zones can be reduced to

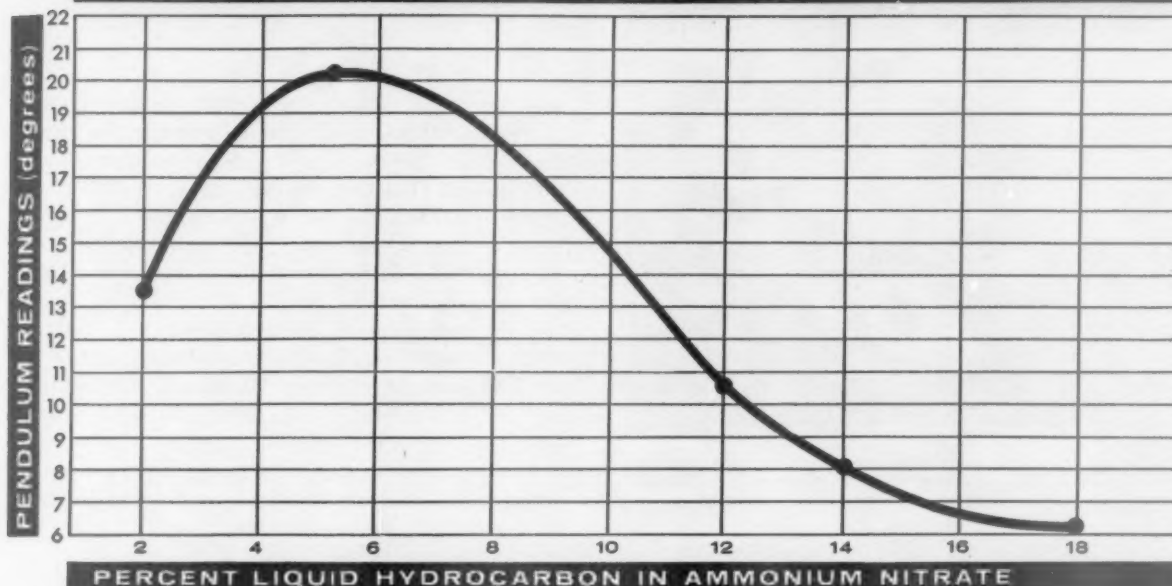
Please turn to page 126

*M/s Associated Cement Co., Ltd., India

KEY TO FIGURE 1: (A) kiln hood, (B) grate cooler, (C) circulating fan, (D) insulated casings with air seals, (E) lagged air duct from hood to circulating fan, (F) lagged pipes for air circulating system



FREE AIR BLAST PENDULUM



As this graph shows, blast output is closely related to the amount of fuel oil absorbed by the solid material. If it is too dense, too little fuel oil is absorbed and optimum

blast energy cannot be released. Spencer N-IV has a special structure which allows it to absorb fuel oil more evenly and completely and release greater blast energy.

Why Spencer N-IV And Fuel Oil Deliver Greater Blast Output Than Higher Density Materials:

Because it soaks up fuel oil better, Spencer N-IV gives more blast energy than higher density, non-absorbent material

Do higher density materials really produce more blast energy? No, say blasting experts.

Actually, the opposite is true. When higher density material is used, the net result is really lower blast output. According to *Military Explosive*, published by the Department of the Army:

"The sensitivity of ammonium nitrate to initiation decreases with increase in loading density. If the density exceeds 0.9 charges of 1 to 3 pounds cannot be detonated completely by large booster charges, and larger quantities cannot be detonated completely at densities greater than 1.1."

The reasons for this are clear. When a higher density, non-absorbent material is used, the outer layer of the particle is coated with too much fuel oil. This retards the efficiency of the explosion when the blast begins.

In addition, the inner layers of the higher density material don't get enough fuel oil. The mixture is too lean so that maximum blast energy cannot be released.

According to extensive research investigations, Spencer N-IV, when mixed with the recommended 6% fuel oil, delivers 20% to 25% more blast energy than equal charges of other solid ammonium nitrate-fuel oil mixtures. There are two main reasons for this:

1. Lower density which provides greater ease of detonation.
2. Special prill structure which allows fuel oil to be absorbed more evenly.

Many other prilled ammonium nitrates have coatings of diatomaceous earth. This coating tends to absorb more fuel oil on the outside of the particle. It reduces the distribution of oil within the particle.

Because Spencer N-IV has no diatomaceous earth coating, fuel oil can penetrate it more evenly. This results in a better fuel balance and much higher blast efficiency.



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HOW TO REDUCE RADIATION LOSSES

continued from page 124



RADIATION LOSSES can even be severe in hot climates, especially when tropical heat alternates with torrential rains. A southern cement plant chose to protect its kilns with a full-length building

practically zero. If hot air nearly at the temperature of the kiln shell is circulated continuously through the annular space between the kiln shell and an outer insulated casing, there is little temperature difference between the kiln shell and the surrounding atmosphere.

In practice, no external casing could be conveniently mounted over the tires and rollers at the burning and calcining zones. This would be less than 10 percent of the total surface at this end of the burning and rotary kiln.

There will be no marked temperature difference between the jacketed and exposed shell surfaces which could possibly affect the refractory lining. The shell of a kiln forms a continuous heat-conducting surface, and heat from the jacketed, higher temperature area would flow to the exposed shell area. This would reduce the temperature, thus bringing down the difference between these areas. This temperature difference could be further reduced by providing a coating of aluminum paint, whose emissivity is about one-fifth that of the uncoated kiln shell, over the exposed, unjacketed portion of the shell. Because of lower radiation losses, the coated shell portion will now be at a higher temperature.

In the schematic representation (Fig. 1) the hot air is shown as being circulated first over the calcining zone adjacent to the burning zone. This would be preferable since the calcining zone shell temperature is higher than that of the burning zone. This is probably because the burning zone refractory serves as an insulant as well as a protective lining.

Let us quickly calculate the rate at which hot air is required. Assuming that the diameter of a given kiln is 11 ft., and its burning and calcining

zone length is 125 ft., the shell surface area is 11,880 sq. ft. Assume, also, an average shell temperature of 250 deg. C. The radiation and convection loss at this temperature, according to Gygi, again is 4,000 k.cal. per sq. meter per hr., or 6.2 k.cal. per sq. ft. per min. Total heat loss from the burning and calcining zone is $6.2 \times 11,880 = 73,660$ k.cal. per min.

Hot air must be supplied at this rate to balance the heat loss. Actually, the temperature of the hot air will have to be about 50 deg. C. higher than the prevailing shell temperature to make allowance for the higher shell temperature rise after it is enclosed, and to compensate for radiation losses from the stationary insulated casing and to make up for cold air leakage between the kiln shell and its casing.

Now all radiation loss from the burning zone has been prevented. But this would not always be good operating practice. The refractory lining will be subjected to higher temperature conditions, and refractory coating formation may be adversely affected. However, by controlling the temperature of the air circulating over the burning zone, optimum conditions for satisfactory coating formation can be readily maintained.

Hot air for the jackets could be obtained either from a separate hot air furnace or from the kiln hood. Only enough high-temperature air is drawn in to maintain the circulating air at the desired temperature level, and the actual rate of heat supply will be well below the calculated figure.

Usually the only conveniently available source of hot air in a cement plant is the excess cooling air vented from a grate type air-quenching cooler. The temperature of this air varies, depending on the extent to which the clinker is cooled and on the efficiency of the kiln. In a Lepol kiln, for example, because of lower-combustion air requirements, the quantity and temperature of the excess cooling air vented into the atmosphere will be more than for a wet process kiln at equal capacity.

For a wet process kiln, whose heat consumption is 1,500 k.cal. per kg. clinker, the heat content of excess cooling air vented from a Fuller type grate cooler is about 45 k.cal. per kg. clinker. Its temperature is between 130 to 150 deg. C. and is obviously too low for purposes of circulating over the burning and calcining zone.

These are the sources referred to in the text: G. Martin, "Chemical Engineering & Thermodynamics Applied to the Cement Rotary Kiln," 1932, pp. 20.1-20.4, and H. Gygi, Proc. Symposium on Chemistry of Cements, London, 1952, pp. 757, 759. END



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Payloads jumped 54% when these Macks took over

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Says Limestone Products' president Harry C. Bixler, "Our experience with Macks goes back 30 years, and, as you know, we've always been more than pleased with their performance. You don't have to ask me what kind of trucks we'll buy in the future."

Outstanding performance characteristics enable Macks to contribute to successful quarry and mining operations throughout

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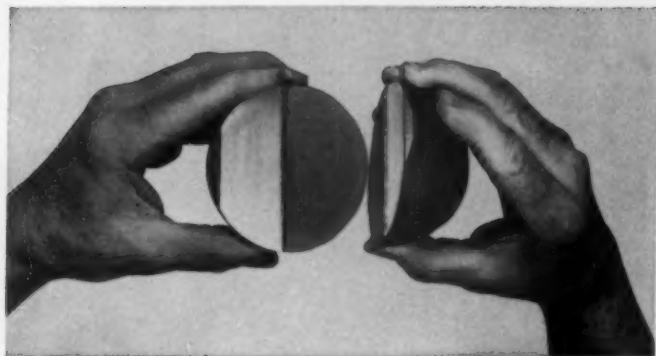
Put Macks to work in your operation, and discover how they'll pay off where it counts most—in your net profit figures. Have your Mack branch or distributor explain in detail which model will fit your job requirements most profitably. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

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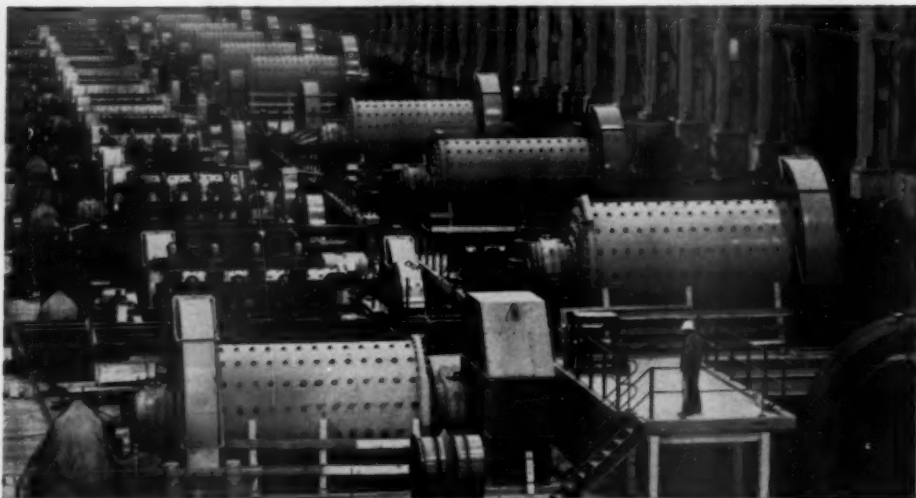
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Here's an idea for shaft-kiln charging

by T. An. Tesch AB*

A NEW AUTOMATIC AND SELECTIVE CHARGING SYSTEM for vertical lime kilns offers the possibility of greater production at lower cost for lime producers. Results indicate that the new charging method will increase production at least 10 per cent, while reducing fuel consumption as much or more. Experience on blast furnaces has shown that use of the system results in less downtime for furnace maintenance and in the production of a more uniform, higher quality product.

The new charging system creates the conditions for greater furnace efficiency by evenly distributing the charge in the throat of the furnace. It has the added advantage of doing this simply and automatically with savings in manpower. The new system was originally developed for use on blast furnaces. It has since been developed for use on lime kilns.

In a kiln charged in the conventional manner, material is usually unevenly distributed. It tends to build up in the center with far less of the charge finding its way to the walls of the kiln. Because of this, the ascending gases, following the path of least resistance, rise much more quickly near the walls of the kiln than in the center (see Fig. 1).

The greater speed of the ascending gases near the walls influences the chemical reaction as well

*Consulting Engineer, Stockholm, Sweden

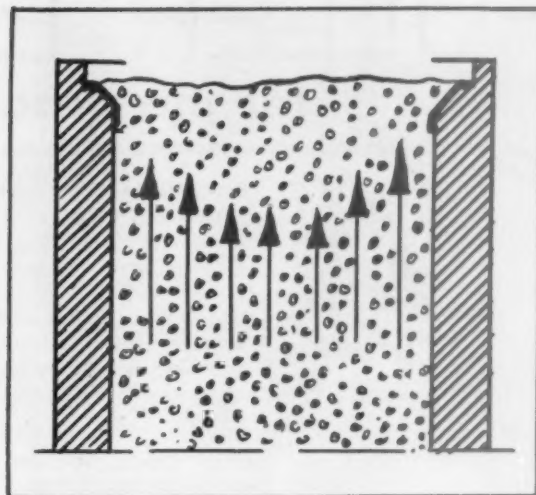


FIG. 1—The relative speed of ascending gases through a conventional vertical shaft kiln is greater near the walls than in the center

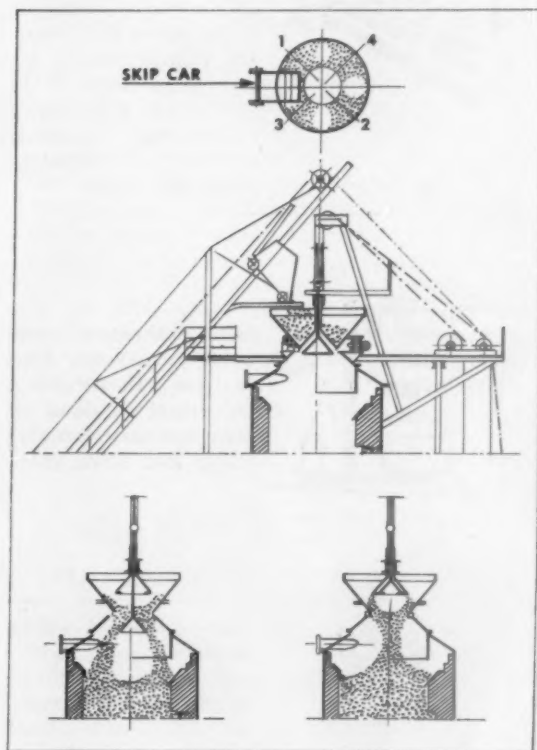


FIG. 2—The flow of limestone is regulated by sequence operation of a pair of bells that direct more or less material to the outer walls of the kiln. At the same time, the receiving hopper is rotated automatically

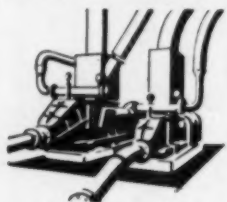
as the temperature, explaining why the walls of the kiln get overheated. The central part of the kiln does not get a sufficient quantity of gas and remains comparatively cold and inactive.

But too high a temperature causes the descend-

Please turn to page 138

FULLER EQUIPMENT

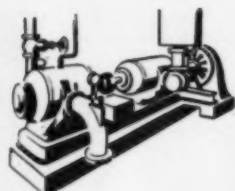
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bulk materials pneumatically. Fuller-Kinyon

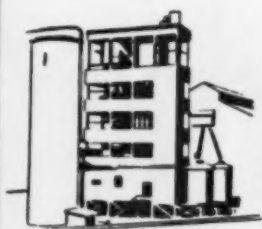
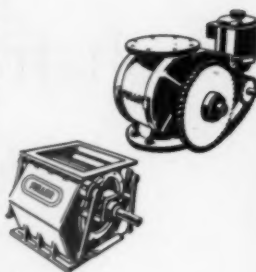
Pneumatic Materials Handling Systems. Widely specified throughout the process industries, Fuller's range of equipment offers best single source for solving problems in moving dry

Pumping Systems, Airveyor® Pressure and Vacuum Conveying Systems, and F-H Airslide® Fluidizing Conveyors are completely sealed to prevent both contamination of the product and any leakage of dust, etc., into the surrounding area. They are used to move dry, granular and pulverized materials to and from cars, ships, trailers, storage and processing points.



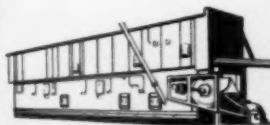
Fuller Rotary Compressors and Vacuum Pumps are vibration-free, can be installed anywhere, even on balconies. Fewer moving parts mean minimum maintenance. Compressors and Vacuum Pumps handle air and gases from 30 to 3300 cfm at pressures to 125 lb. gage. Vacuums to 29.95 in. (referred to 30-in. barometer).

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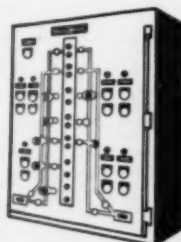
Fuller Preheaters, Humboldt Suspension Type . . . for preheating dry, pulverized Portland cement raw materials with rotary kiln waste gases.

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SOIL CEMENT: ANSWER TO AGGREGATES SHORTAGE

by Allen S. Koch

ORANGE COUNTY, CALIF., is known as the home of Disneyland. It also is one of the fastest growing areas in the state of California, a factor of paramount importance to us in the County Road Department. It means that our present major county highways will be carrying much higher volumes of traffic, and that many of the unimportant roads of today will be handling several thousand vehicles daily within the next decade. Roads must be engineered and designed for these higher traffic volumes and built to last a long time.

Of course, all this takes materials, and Orange County has a very limited supply of good rock aggregate material to begin with. This aggregate is located only in certain areas. Therefore, we are quite serious about conservation of our aggregate. We have to be.

With this in mind, and for other considerations which shall become evident, we began using soil-cement in Orange County about three years ago. Soil-cement, or cement-treated base as it is known in many areas, has been used in 10 projects that have included several types of work. Traffic volumes on our roads having soil-cement base range from 400 to more than 20,000 vehicles daily. The base has been mixed in place and mixed in a central batch plant; both native soil and imported aggregate have been utilized for mixing with cement and water. You can see we have had varied experiences with soil-cement in these three years.

Please turn page



A HIGH-CAPACITY central preparation plant helps keep soil cement costs low

It certainly is no secret that in some areas of the United States the supply of good aggregates is diminishing. With the highway program gaining momentum, the problem will be accentuated. This has led to a growing concern for conservation of aggregates. Mr. Warren D. Fish, Chief of the Construction Administration Branch, Bureau of Public Roads, gave his views on the importance of conservation in the February and March 1959 issues of ROCK PRODUCTS. As a followup to that series, we'd like to show what one county engineer is doing about it—has been doing for the last three years. These are the remarks of Mr. Allen S. Koch, County Surveyor and Road Commissioner of Orange County, Calif., taken from a speech given at the Dallas, Texas, meeting of American Road Builders' Association.

CENTRALLY MIXED MATERIAL is carefully bladed and compacted to build up low spots and weak subgrades



SOIL CEMENT: ANSWER TO AGGREGATES SHORTAGE

continued from page 131



THE FINISHED PRODUCT in action in Orange County where a narrow concrete road has been widened to modern standards

In every instance where soil-cement has been used in Orange County, it has been economically sound. But, in addition to economy, there are other considerations involved in our choice of soil-cement as a base material for these projects. We have utilized soil-cement because it performed a job where it was the most satisfactory material for a given situation. Furthermore, on a number of county projects cement treatment enabled us to use existing materials and conserve our aggregate material for future use.

Most of our native soil is not suitable for sub-base material without stabilization. By using the cement treatment principle for such stabilization, we conserve our good aggregate for concrete construction and other work where rock aggregate is a necessity. In some instances, cement mixed with the native soil has produced sufficient strength for satisfactory stabilization, altogether eliminating the use of any imported aggregate. In other projects, cement has been mixed with imported select material or low-grade mineral aggregate for base material. While some aggregate may be used in these instances, the amount is reduced considerably from that required for an all-rock base.

Soil-cement has been most successful as base material for widening existing concrete pavements. The problem of cracking which sometimes

results in joining a flexible and a rigid pavement has been greatly diminished by the use of a semi-rigid base in the form of soil-cement.

There is one additional advantage—a structural one. The country's first project proved the strength of cement-treated base by bridging over many small unstable spots below subgrade level with this method of stabilization. From a construction standpoint, considerable money is saved by not excavating such a poor subsoil and backfilling prior to constructing the base.

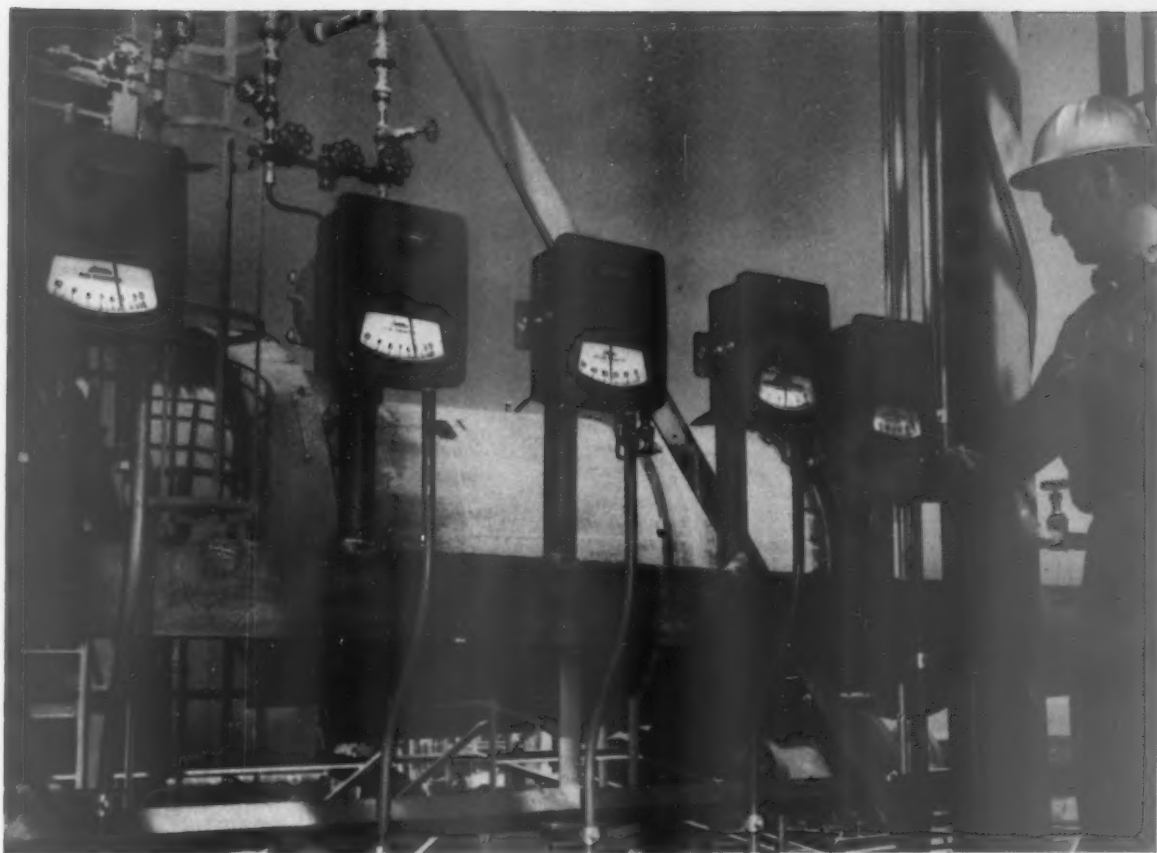
All of the factors mentioned—economy, best performance for a given situation, structural superiority—make soil-cement a good buy in Orange County. However, I do want to re-emphasize the other factor which is particularly appealing to us: Preservation of good aggregate resources for future work when cement-treatment stabilization is equally economical. Such consideration is important in all long-range planning.

There must be many other areas of the nation where good aggregate is limited. City or county officials in such areas should give thoughtful consideration to use of soil-cement as an aggregate conservation measure. It is imperative that those of us charged with road and street planning and construction examine our natural material resources and make best use of them in respect to future requirements.

END

SOIL CEMENT can also be mixed in place to produce a dense, uniform pavement





Type 630 indicating electronic Consotrol transmitter — shown here operating in a leading cement plant — may be equipped with any standard Foxboro measuring element. Transmitter continues to measure and indicate even in event of power failure.

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Type 613 d/p Cell* transmitter combines simplicity and accuracy of force-balance with speed and convenience of electrical transmission. Requires no power supply at the transmitter.

*Reg. U. S. Pat. Off.

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ROCK PRODUCTS, August, 1960

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133

Section 16 is by J. F. McLaughlin, K. B. Woods, both of Purdue University and distinguished research specialists, R. C. Mielenz, director of research, Master Builders Co., Cleveland, Ohio, and the writer of these Notes. This section is concerned with the distribution, production and engineering characteristics of aggregates. The section begins with definition of aggregates, origin of aggregates and the kinds of aggregates as geographically distributed in North America. The part on production and processing of aggregates is based on a paper by this writer in the "Symposium on Mineral Aggregates," ASTM Special Technical Publication 83, 1948, considerably revised and brought up-to-date—and boiled down to seven pages.

Under "properties of aggregates," by Dr. Mielenz, it is stated: "The internal pore characteristics are the most important properties of aggregates. The size, abundance and continuity of pores influence or control such qualities as strength, elasticity, abrasion resistance, surface texture, specific gravity, bond with cementitious binders, resistance to freezing and thawing action, and the rate and magnitude of various cement-aggregate reactions." We quote that to show how different is the present-day conception of the aggregate producers' problems from those of his predecessors who would pick up a handful of gravel, casually examine it, maybe rub it around in the palms of their hands and decide then and there if it would make good concrete. Usually it did. The thought that occurs to us here is that the concrete itself should be judged by the same characteristic of porosity—which is just as important, or more so, than the porosity of the aggregates.

The authors of the section on portland cement concrete, materials and mix design are Leo H. Corning, chief consulting structural engineer, Portland Cement Association; H. L. Flodin, retired, PCA, and W. J. McCoy, director of research, Lehigh Portland Cement Co. This section comprises only 40 pp. and is confined chiefly to a summary of ASTM test methods. There is practically no reference to the manufacture of portland cement as such. This is in contrast to the following section on "Bituminous Materials and Mixtures," by W. H. Goetz and Dr. L. E. Wood, both of Purdue University. Here the processes of producing and refining bituminous binders is described in some detail, with flowsheets, etc. It may be argued that the highway engineer, contractor and aggregate producer don't need to know anything about the manufacturing process for such a "standard" product as portland cement. The same argument then should be applied to asphalt, for it is at least doubtful if portland cement is any more

uniform in quality than asphalt. This section on asphalt is one of the two longest (102 pp.).

Section 20 on pavement slipperiness is of considerable interest to aggregate producers, since it brings to light some additional attributes of aggregates. For example, we quote: "The antiskid properties of a well designed pavement surface are dependent to a large degree upon the polishing characteristics of the mineral aggregate or aggregates of which the paving mixture is composed. Skid resistance will be dependent to a lesser degree upon the type of cementing agent, the gradation and the openness of mixture . . ." Incidentally, limestone aggregates have acquired a poor reputation in this respect as causing slippery pavements with both portland cement and bituminous binders. However, our author here (Dr. John W. Shupe, associate professor, Applied Mechanics Department, Kansas State College) qualifies general condemnation of limestone thus: "Economic considerations, as well as many desirable qualities of limestone aggregate in paving mixtures, warrant maximum utilization of this material without, of course, sacrificing highway safety." Kansas highway engineers must be hard put to choose between sand and gravel that reacts with alkali in cement, and the alternative, limestone, which results in slippery pavements!

The section on soil stabilization is, of course, of much interest and value to cement and lime producers. This is the longest section in the book—133 pp. The authors are A. W. Johnson, engineer of soils and foundations, Highway Research Board, on cement-soil mixtures; Dr. Moreland Herrin, associate professor of civil engineering, University of Illinois, on bituminous soil and aggregate stabilization; Dr. D. T. Davidson, professor of civil engineering, Iowa State University, on soil stabilization with lime, lime-pozzolan, chlorides, lignin derivatives, and other chemicals; and Dr. R. L. Handy, assistant professor of civil engineering, Iowa State University, in collaboration with Dr. Davidson.

The use of portland cement for soil stabilization has been pretty well developed, and there is a quantity of available literature on the subject. The use of lime is more recent. After describing the chemical reactions involved, our authors make the following observation which, if generally approved by highway engineers, would greatly extend the use of lime: "The efficiency of lime at reducing soil plasticity has been utilized to advantage in soil-cement and soil-bituminous mixtures. Preliminary addition of 1 to 2 percent lime to fine-grained soils lowers plasticity and improves mixing with port-

Please turn to page 136



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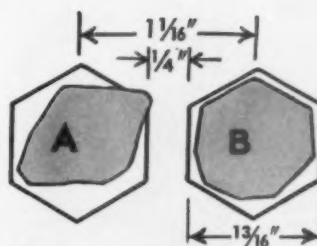
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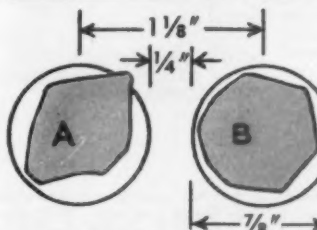
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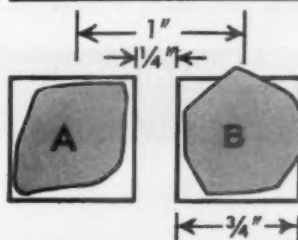


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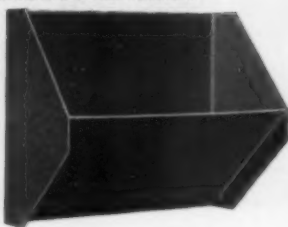
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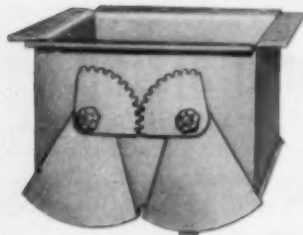
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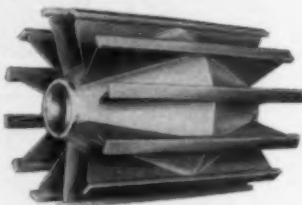


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ROCKY'S NOTES

continued from page 134

land cement, road tar or asphalt. Better mixing correlates with better strength and durability. U. S. Army Corps of Engineers' data show that, in one instance, treatment with 2 percent lime and 6 percent cement was essentially equal to treatment with 10 percent cement."

In the section on design of rigid pavements, we are personally much pleased to see the emphasis placed on granular subbases, because we were among the very first to advocate such bases under portland cement concrete pavements. The cement industry and many highway engineers opposed the idea as unnecessary and merely adding cost to an already high-cost pavement. Our first effusion on the subject was as an associate editor of *Engineering News*, a brief editorial about 50 years ago, after inspecting the excellent concrete pavements laid on Long Island sands. We kept up the agitation after becoming editor of *ROCK PRODUCTS*. The unanimous acceptance of this idea has done much to increase the demand for commercial sand and gravel, for the material must be as carefully prepared as concrete aggregate.

We have touched on only a few of the subjects contained in this comprehensive textbook. It does indeed deserve a place on the desk, or within easy reach, of every producer of highway materials. He will find specification requirements, test methods, contract requirements and, last but not least, some sound sales arguments for well-prepared commercial materials.

END

SCREEN EFFICIENCY

continued from page 122

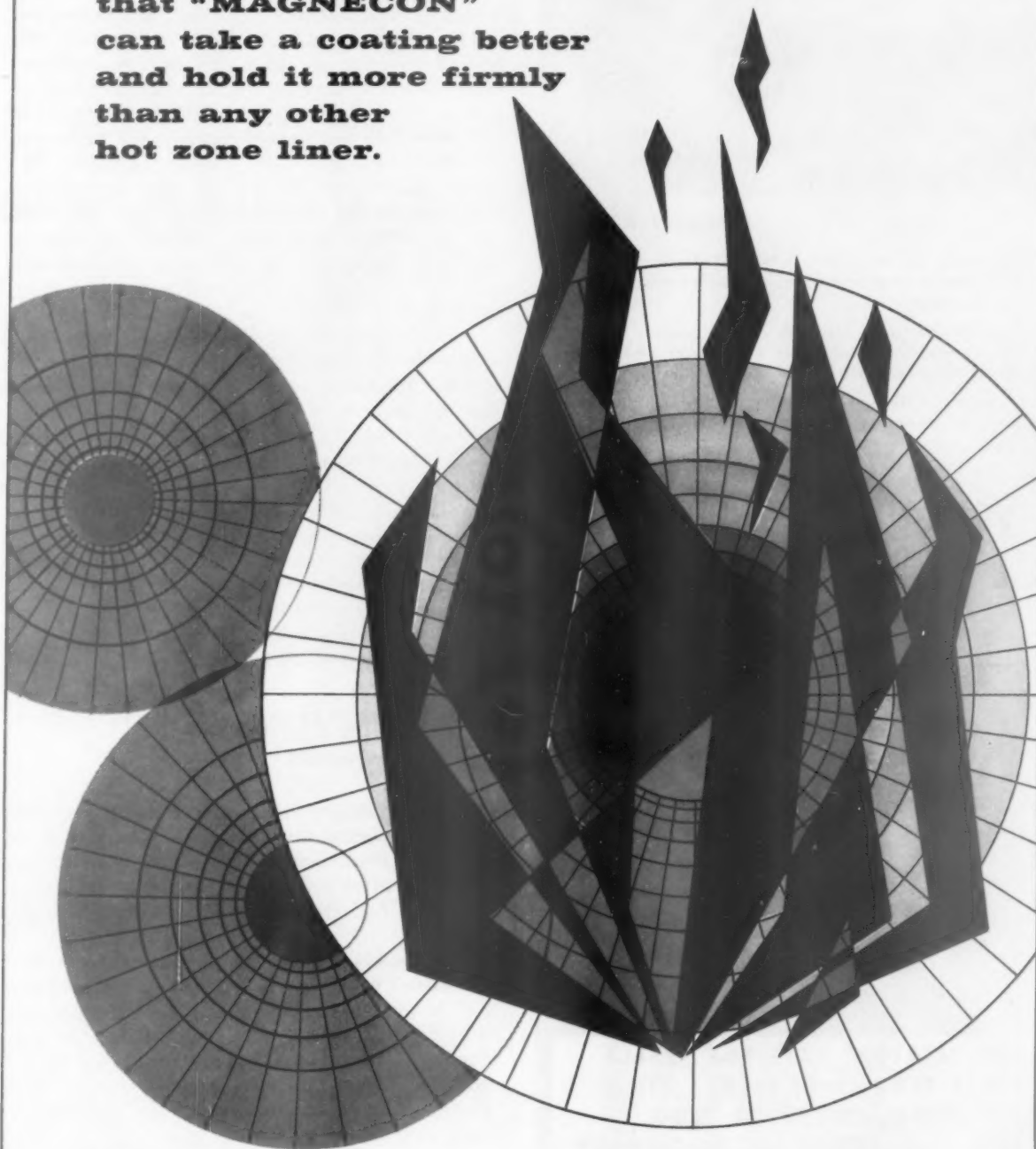
Equation (10) is the basic formula for determining efficiency of any classifier or concentrator at any desired separation point. If an exact separation is desired and there is a test to establish how well it has been accomplished, such as a sieve for size separations (or chemical analysis for ore separations), the evaluation of equipment performance involves only the straightforward use of that formula.

This efficiency formula is ideal in cases where an ore must be reduced below a certain size to release its mineral, and a classifier is used in the grinding circuit to ensure reaching that size. The same holds true for classifying cement raw mix in an air separator, where the requirement merely is the reduction below a certain size.

From a study of the table, it can be seen that the formula is highly applicable to a variety of minerals-processing equipment.

Please turn to page 138

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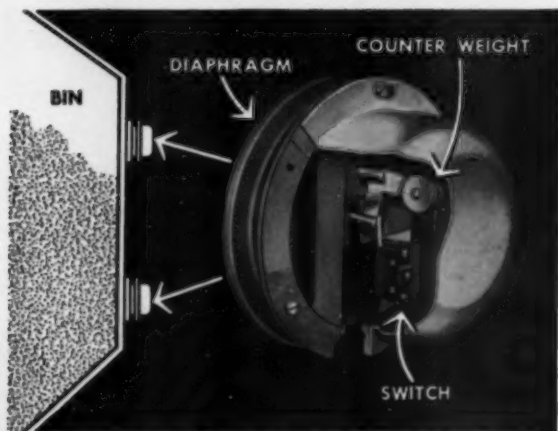
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SCREEN EFFICIENCY

continued from page 136

A low efficiency result isn't necessarily indicative of poor performance; it may be a characteristic of the type of equipment, the process, the testing criterion or other factors. The principal value is in comparison within a specific field of equipment, comparison of the effect of an altered variable or comparison between types of processes.

Certain factors do place limitations on this efficiency calculation. Many classifier applications, for example, are aimed at giving a product that has no definite separation requirement. Among them are the separation of a sand into masonry and concrete sand fractions or the removal of cement from a mill product. In both cases, a range of material sizes in the product is both desirable and necessary. Therefore, the efficiency calculation method given here, even though far better than the old percent-of-recovery method, falls short of the desired goal of performance evaluation that ideally would be provided by a single quantitative figure.

Admittedly, this may just be the first step in understanding true efficiency. This type of efficiency formula, used in conjunction with recent advances in the fields of probability and statistics, may some day yield the formula desired. At any rate, the need for further development of a classification technology is apparent.

END

SHAFT-KILN CHARGING

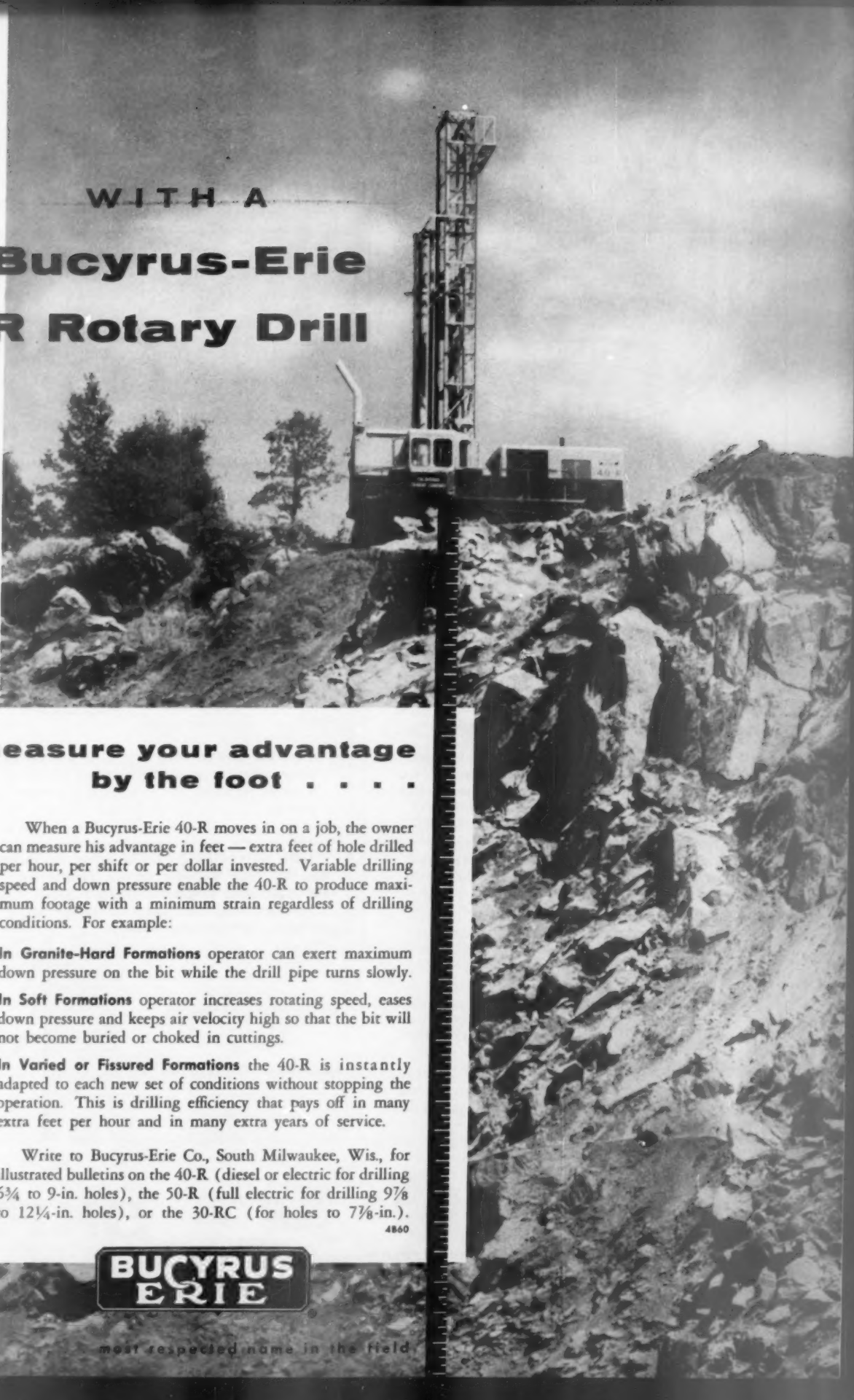
continued from page 129

ing raw material to attack the furnace lining. This creates "hangings," and poking is required to rid the walls of "stickers." This reduces the efficiency of the operation resulting in a poor quality of product, high fuel consumption and damage to the lining.

This trouble is found in many conventional shaft furnaces. Furnace experts claim that over 40 percent of the total volume of the shaft furnace does not efficiently take part in the action of the kiln. For lime kilns this may mean an unevenly burned lime. Because of this, it is claimed that many lime producers find it advantageous, if not necessary, to burn their limestone twice.

The new selective charging system eliminates this condition. This is mechanically accomplished by closing the top of the shaft with a double bell (see Fig. 2). The bells are arranged one above the other inside a receiving hopper at the top of the kiln. The upper bell can be tightened against a seat connected to the plate shell of the kiln completely

Please turn to page 141



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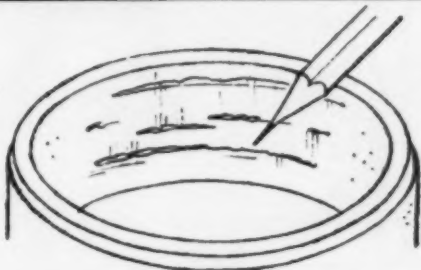
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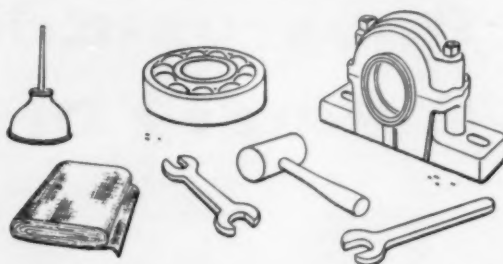
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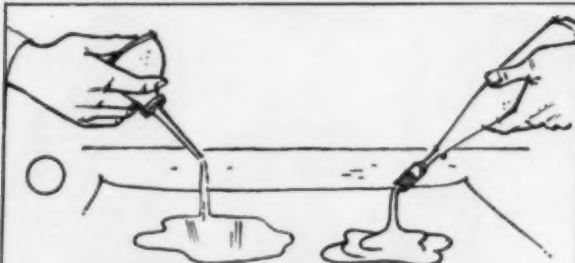
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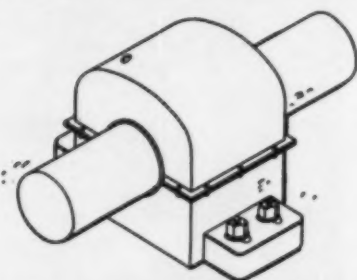
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SHAFT-KILN CHARGING

continued from page 138

shutting off any flow of material to the kiln. In this closed position the lower bell is inside the upper bell (see Fig. 2). Both bells are manipulated automatically and independently.

Raising the upper bell allows material to flow into the kiln. Manipulation of the lower bell controls the direction of flow. Raising it allows the charge to flow into the center of the kiln; lowering it places it in the path of the flow, deflecting the charge toward the kiln walls.

The operator, having decided the proportion of wall to center charging, uses a program selector to automatically execute the charging sequence. In practice it has been found the walls require two or three charges, while the center receives only one.

This charging system employs one other innovation to achieve even material distribution. The receiving hopper on top of the kiln is rotated a few degrees each time material is discharged into the kiln. This avoids dumping every charge at the same place in the kiln and helps obtain an even stockline. This whole charging system can be completely automatic. It requires only a supervisor to check the mechanism from time to time, determining eventual changes in the sequence of charging.

A Japanese lime producer is now negotiating a contract for two 150-ton per day gas-fired kilns equipped with this automatic and selective charging system.

END

PERCENTAGE DEPLETION . . .

continued from page 95

hering to their previous view that clay should be included in any new legislation. However, Treasury did seem impressed by arguments that the initial bill be limited to cement and that clay be dealt with separately at a later date, and they asked for estimates of the revenue effects of such a proposal. The figures submitted by the group in response to this request (see Table I) showed that the loss to Treasury as a result of end-product depletion would be \$36 million for 1959.

Treasury balked, however, on one important point: the retroactive feature of the industry-suggested bill. Treasury wanted to wait several years to determine a further trend of court decisions before settling on the retroactive clause; if all decisions continued to go against Treasury, they would then accept the retroactive principle. The cement group replied that the entire industry would strenuously oppose such a proposal. Notwithstanding, it still appeared likely that if the in-

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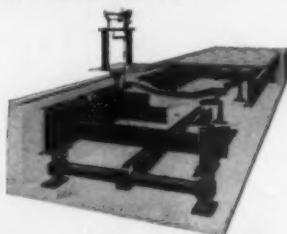
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PERCENTAGE DEPLETION . . .

continued from page 141

dustry would back the original proposal, it could be enacted into law. (The new Public Debt & Tax Rate Extension Act of 1960 applies only with respect to taxable years beginning after December 31, 1960.)

Here the matter stood until August 5, when the bill as originally proposed, establishing the kiln feed cut-off point for the future and end-product value for the past, was considered in closed session of the Ways & Means Committee. Although what went on in that meeting has never been made public, the bill was not reported out. Indications are that efforts of the cement industry group failed for two principal reasons:

- It was never able to get a substantial majority of the industry behind it.

- Considerable pressure was exerted on the Ways & Means Committee by several members to maintain uncompromisingly the end-product concept of percentage depletion.

In the meantime, Treasury—really, for the first time—came up with some good arguments in the Cannelton Sewer Pipe case in its quest for the court precedent Treasury officials have sought for so long. As a result, there was increasingly less disposition at Treasury to compromise.

Walter Wecker insists that Congressmen, generally, believe that the present law goes beyond what Congress intended to provide in the way of percentage depletion allowances on gross income from mining. A spokesman for another segment of the mining industry said recently that if the Ways & Means Committee hears only the views of taxpayers who urge a position which seems extreme, there is a real risk that the committee may throw up its hands, jettison any attempt to codify traditional "ordinary treatment processes" and report out legislation adversely modifying that which Congress and the Treasury have heretofore granted. Happily, this didn't happen. One potent reason is, undoubtedly, because a sizeable segment of taxpayers engaged in mining told Congress they favored maintenance of long-standing procedures.

The feeling of the majority of the Ways & Means Committee was probably well summed up by Congressman Baker when he said recently:

"In my opinion, it is extremely important that the percentage depletion concept be continued on a sound and reasonable basis. There is a strong feeling among the members of the Ways & Means Committee that legislation clearly defining gross income from mining for percentage depletion purposes should be enacted. When and if that happens, many other members of the Committee will join me in an attempt to call a halt to repetitious, unnecessary and expensive litigation over existing rights under present law."

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UNION ROCK BRACKETS ITS MARKET *continued from page 105*

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Haulage units, 13-cu. yd., bottom dump (2) . . . Euclid Div., GMC

DRY PLANT

Jaw crusher, 25 x 40-in. { Austin Western Construction
Equipment Div.
Vibrating feeder, 4 x 10-ft. } Hewitt-Robins Inc.
Conveyor idlers }
Cone crusher, 7-ft. standard Nordberg Mfg. Co.
Cone crusher, 4-ft. short head Smith Engineering Works
Vibrating screens (5) W. S. Tyler Co.
Rehandling loader, 2 1/4-cu. yd. Clark Equipment Co.
Conveyors Dodge Mfg. Co.

WET PLANT

Single screw classifier, 36-in. } Eagle Iron Works
Twin screw classifier, 36-in. }
Sand scalping tank, 28-ft. }
Vibrating screen, twin-deck, 5 x 15-ft. Iowa Mfg. Co.
Vibrating screen, single-deck Hewitt-Robins Inc.
Design and construction Union Rock & Materials

HOW TO BARGAIN AS A GROUP *continued from page 112*

state capitol or working for reforms in specifications or building practices of importance to all members of the industry. Oviatt has helped build this feeling of solidarity by issuing a newsletter each month, full of items of particular interest to Connecticut ready mix producers.

● Care should be taken not to tie the hands of the industry negotiating committee by forcing them to clear every minuscule point with the entire group. The only member that has dropped out of the Connecticut Association was lost for this reason; he simply couldn't see permitting the committee sufficient latitude in its work. "But," says Oviatt, "we can't come running back to the membership and go through a big argument every time we're on the verge of reaching agreement on a negotiable item. The group gives us broad direc-

Please turn to page 146



PEERLESS keeps one eye on the blue pen . . .

And their kilns and waste heat boilers give 20/20 performance!

You see, the Peerless Cement Company of Detroit uses a Bailey Gas Analyzer-Recorder on each of three manually-operated 178' kilns. On a single chart, the Analyzer-Recorder shows both percent oxygen (red pen) and percent combustibles (blue pen). It's the "blue pen" that shows the *truer* picture of combustion conditions—overfiring or underfiring. And it's the burnerman's job to keep the "blue pen" on zero.

This controlled combustion gives the following results:

In kilns, improved stability of operation through maintenance of proper burning conditions, at very definite fuel savings.

In waste heat boilers. By keeping combustion in the burning zone of the kiln, and out of the boiler . . . reduced slagging, longer boiler brick life, more uniform water-level control, and reduced boiler tube erosion.

Your Bailey Engineer can help you plan for peak performance. Call him, or write for your Bailey Kiln Control Folder.

CEMENT DIVISION BAILEY METER COMPANY

1039 IVANHOE ROAD • CLEVELAND 10, OHIO

In Canada—Bailey Meter Company Limited, Montreal

ROCK PRODUCTS, August, 1960

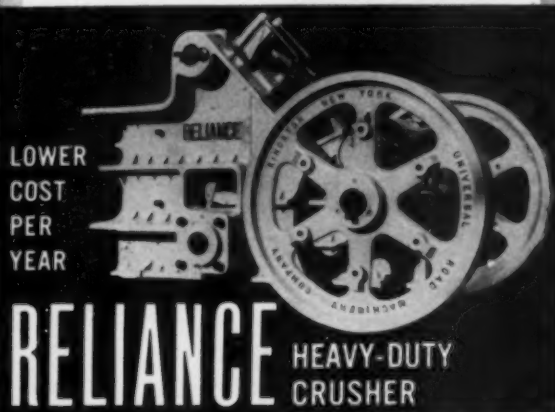
C 117-1



Enter 1018 on Reader Card

LEVER-TYPE JAW CRUSHER STILL IN USE AFTER 36 YEARS

—at Keystone, So. Dakota



LOWER
COST
PER
YEAR

RELIANCE HEAVY-DUTY
CRUSHER

- Heavier, stable—you save money on upkeep.
- Minimum abrasion — outlasts other designs 3 to 1.
- Long jaw plates — adjustable for fineness.
- Crushing, screening and washing plants—50 to 1,500 tons-per-day capacity — engineered to your needs.

Booklet on request, pictures installations.

UNIVERSAL ROAD MACHINERY CO.

Main office and factory: Kingston, N. Y.
New York City office: 117 Liberty St.

Enter 1076 on Reader Card

MONTH AFTER MONTH YEAR AFTER YEAR ROCK PRODUCTS GIVES ITS READERS THAT EXTRA IMPACT THAT MAKES FOR EXTRA PROFITS



FOR 62 YEARS ROCK PRODUCTS has been the editorial and market research leader in the world of cement and its sister industries. Over 17,600 readers pay to get ROCK PRODUCTS for its timely, informative articles. Enter your subscription now and take advantage of the powerful and exciting suggestions for profitable plant operations that appear in every issue.

ROCK
PRODUCTS

79 West Monroe Street, Chicago 3, Illinois

HOW TO BARGAIN AS A GROUP

continued from page 144

tives, within which we must have some freedom of movement."

• In order to make things easier at contract time, the Connecticut group has set up a permanent state committee to represent the producers when between-negotiation labor problems arise. The various local unions involved have also established such a committee (there are five men in each group). They meet from time to time to discuss mutual problems. Although nothing earth-shaking has come out of these meetings, they do serve to provide continuity to the Association arrangement and also offer a mechanism for the discussion of any difficulties that may arise in the future. And no one knows how many potential labor problems this committee has prevented.

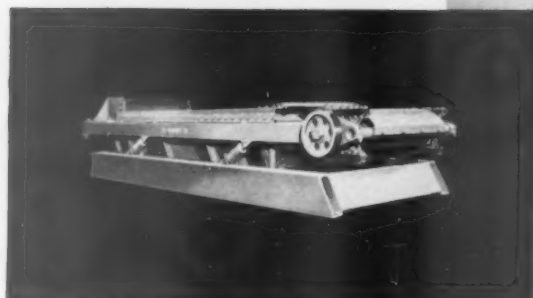
• Producers must be careful not to be thrust into the position of doing organizing work for the unions who will try, whenever possible, to use the producers' Association as a lever to organize non-union producers. Association members should be alert to this and be careful not to become involved.

Oviatt also suggested three bargaining techniques of major importance: (1) Don't talk money until all the side issues and language of the contract have been cleared up. (2) Write up and sign each point that is successfully negotiated—at the time agreement is reached. (3) Be patient; if you can outlast the other guy, you'll stand a better chance of being successful in your negotiations.

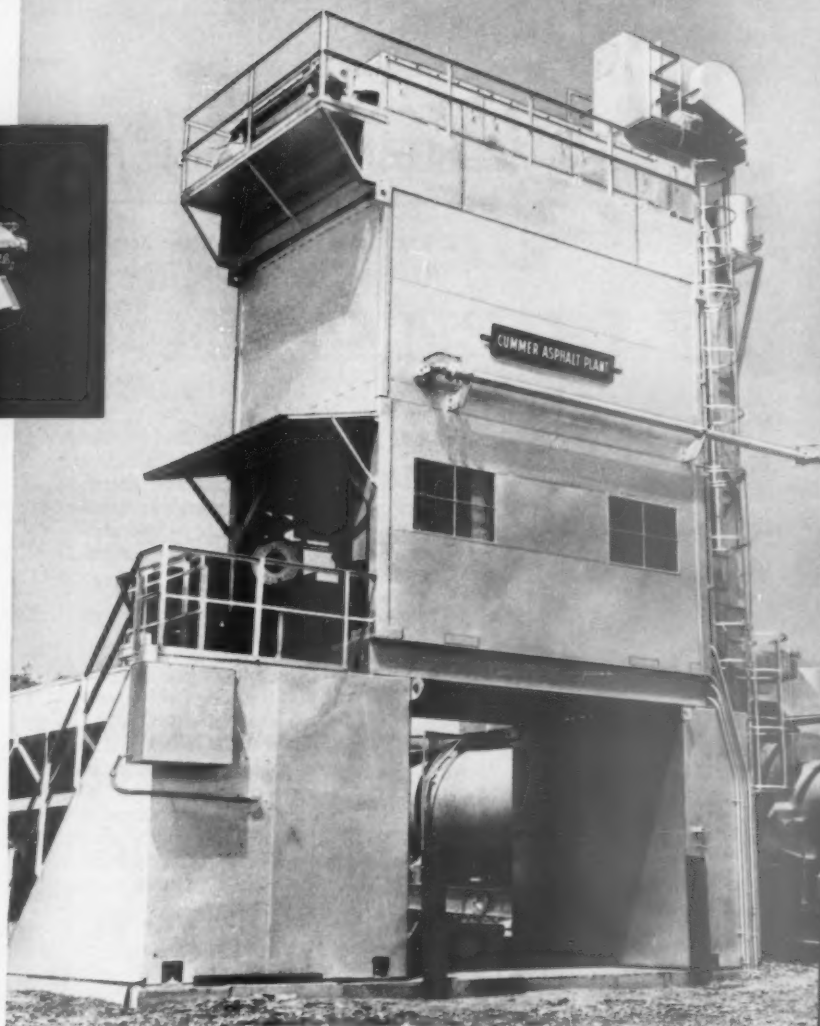
Present cost for membership in the Connecticut Ready Mixed Concrete Association is \$350 per year for full members and \$150 for associate members. This will probably be raised in the next year or so, and a technical expert added to the Association's staff to assist in work on behalf of the industry with technical and engineering agencies and organizations.

"Our biggest problem—and I suppose the biggest faced by any similar group, anywhere," says Oviatt, "is that most people are fundamentally distrustful of each other. This is sad, but unfortunately true. It's a tough thing to overcome in bringing a group of competitors together. Still, group action is the only way we can deal effectively with powerful unions. It doesn't take the union long to realize that we mean business—and that we're in business to stay. Then—and only then—can we talk from a position of strength." **END**

Editor's Note: The final article of this series will cover the solution of rock industry labor problems in New Orleans, Louisiana.



Cummer
Asphalt Plants
 rely on
SYMONS
SCREENS
 for high capacity
 accurate sizing



Here are some of the reasons why leading asphalt plant manufacturers like F. D. Cummer & Son Co. standardize on Symons Type "F" horizontal vibrating screens for sizing multi-aggregate bituminous mix . . . *Better sizing*—level position of the screen eliminates bouncing and cascading of material. Positive action stratifies material for closer sizing; *High capacity*—vigorous screening and conveying action gives the "F" Screen greater capacity; *Adaptability*—level position shortens

elevators, simplifies construction, reduces plant dimensions; *Multiple separation*—multiple decks provide the facility for using a variety of screen surfaces; Drive unit is located outside the screen housing, away from dust and heat to assure low maintenance.

Be sure to specify SYMONS TYPE "F" HORIZONTAL VIBRATING SCREENS . . . for providing higher capacity and more accurate sizing. Write for literature.

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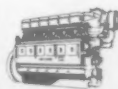
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 SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VANCOUVER • JOHANNESBURG • LONDON • MEXICO, D. F.

NEW LITERATURE

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



Arc welding guide

HOBART BROS. CO. has released a handbook entitled "Vest Pocket Guide to Better Welds." It contains 80 pages of arc welding information. The booklet gives information on five essentials for proper welding procedures and examples of good and bad welds. Also included are various welding guides.

Enter 500 on Reader Card

Wire rope

A CONDENSED CATALOG listing of new up-to-date weights and strengths of Improved Plow Steel and Extra Improved Plow Steel have recently been released in bulletin #6025 by Macwhyte Wire Rope Co. Also included is a complete explanation and description of wire rope constructions and types as well as helpful information for ordering wire rope.

Enter 501 on Reader Card

Vibratory equipment

SYNTRON CO. is offering a condensed catalog of vibratory materials handling equipment, vibrating parts handling equipment, power rectification equipment, mechanical shaft seals,

paper joggers and portable power tools. The 68-page catalog presents descriptions, data and specifications on all the company's products. It also shows products in operation.

Enter 502 on Reader Card

Rotary compressor

BULLETIN #E-263, describing Model 600 RP rotary compressor, has been made available by Davey Compressor Co. The unit delivers 625 cfm at 100 psi. Operating principles and specifications are described for both 4-wheel trailer and skid-mounted machines. A list of air tools which can be operated by the compressor is included.

Enter 503 on Reader Card

V-belt catalog

DAYTON INDUSTRIAL PRODUCTS CO. has released a comprehensive catalog covering its line of industrial v-belts. The 52-page catalog lists the company's complete product line with data on sizes, dimensions and prices. A special section on hose lists information about the company's line of molded braided, horizontal braided, machine-built wrapped fabric, hand-built wrapped fabric and woven jacket hose. Data also covers recommended hose applications in specific fields.

Enter 504 on Reader Card

Fabric dust collector

AMERICAN AIR FILTER CO., INC., Dept. PD, has issued a bulletin that introduces the company's cylindrical fabric dry dust collector that reclaims process materials. The fabric dust collector can be shipped in small sections and assembled at the installation site. It is adaptable to any application requiring the reclaiming of dry materials. The filter fabric is cleaned by using a positive air cushion to remove the entrained dust.

Enter 505 on Reader Card

DRILLING ROCK WITH COUPLED STEELS



Rock drilling

THOR POWER TOOL CO. has released an 8-page illustrated brochure entitled "Drilling Rock with Coupled Steels" detailing proper operational and maintenance procedures for coupled rock drill steels. The bulletin discusses and illustrates correct rotation, drill, and feed control operations, starting a hole, proper feed, drilling, and lubrication practices, adding and removing steels, bit care and dust control.

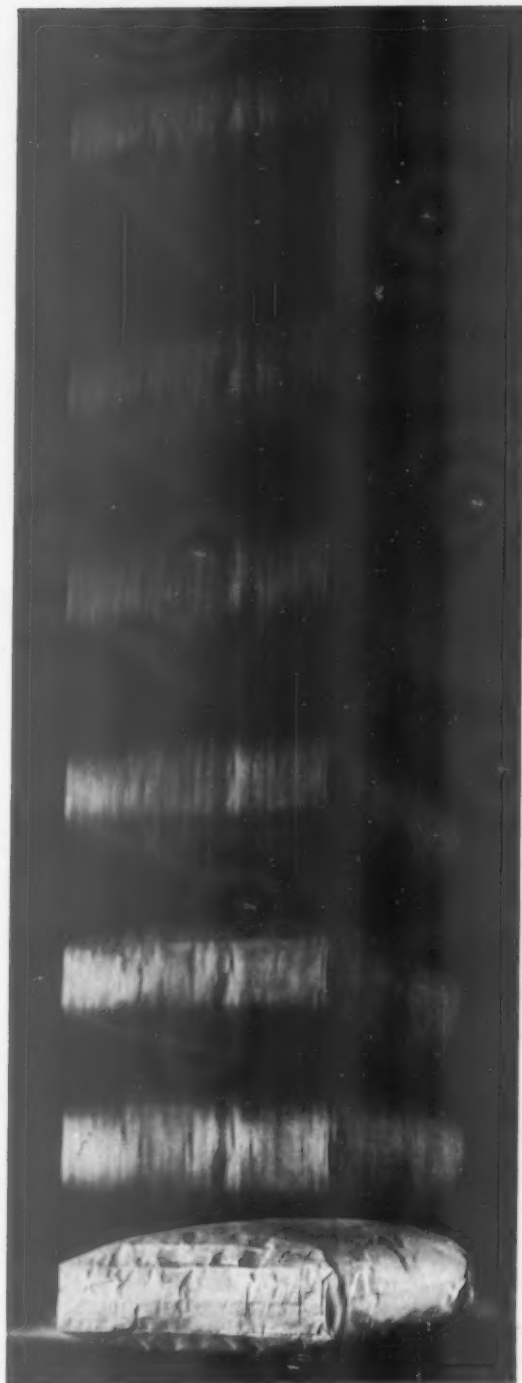
Enter 506 on Reader Card

TV bulletin

GENERAL ELECTRIC Communications Products Dept. has issued a bulletin on their transistorized closed circuit television camera. Detailed information covering the reliability and performance capabilities of the self-contained, single-unit camera is offered. The bulletin also explains the installation, operating and maintenance costs of the new model camera. Charts illustrate how individual systems can be custom-built with standard units in the company's closed circuit line. Electrical, mechanical and environmental specifications also are listed for the cylindrical, 9-lb. camera enclosed in a dust-tight housing.

Enter 507 on Reader Card

(Continued on page 150)



You're really hitting the jackpot when you get *better* multiwalls for *less money*...

Bemis EXTENSIBLE Multiwalls

They are better than conventional multiwalls because they are shock-resistant. More than two years of use has proved that breakage is greatly minimized. And they frequently cost less because the greater strength lets you use a lighter basis weight bag. Read these convincing quotes from men who know from experience about Bemis Extensible Multiwalls...

Cement plant superintendent:

"These extensible bags are the best paper bags we have ever used. As far as I am concerned, we won't use anything else."

Cement packhouse foreman:

"I caught my men amusing themselves by letting these 'rubber' bags run off the end of the conveyor and bounce on the cement floor. Our regular bags burst on this drop."

Assistant cement packhouse foreman:

"We broke only two bags in two weeks. We don't want anything else."

Assistant cement plant superintendent:

"Your extensible bags have eliminated our serious customer complaints."

Cement company traffic manager:

"I didn't believe you before, because I have heard exorbitant claims in the past. Now I am sold—we haven't had a serious complaint since we switched to your 'stretch' bag."

Bemis pioneered extensible multiwalls, so we have had longer experience with them than any other bag maker. You can profit by that experience. Get in touch with your Bemis Man promptly.

Bemis *Where flexible packaging ideas are born*

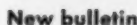
GENERAL OFFICES — 408-M PINE ST., ST. LOUIS 2

ROCK PRODUCTS, August, 1960



Enter 1059 on Reader Card

(Continued from page 148)



stop rotation in either direction but permits free rotation and transmission of high driving torque in the opposite direction. It also can be used as a two dimensional over-running clutch. Specifications and industrial applications of the device are described.

Enter 508 on Reader Card

THE JEFFREY MFG. CO. has published a catalog describing the company's line of mechanical vibrating conveyors. Covered in the illustrated catalog are four types of conveyors: the heavy-duty conveyor, twin mass conveyor, medium duty-medium weight conveyor and the low capacity-low weight conveyor. Also included is a section devoted to the company's other equipment, such as vibrating feeders, weigh feeders, dryers, coolers, barrel packers, screens, and separators.

Enter 509 on Reader Card

FORD MOTOR Co., Tractor & Implement Div. has just published a booklet on the company's tractors and equipment for construction; 33 action photographs in the booklet show the

company's loaders, backhoes, dozers, earth-cavators, fork lifts, cranes and other industrial equipment in use with the company's tractors. The applications described include heavy and light excavating; heavy and light loading; scraping, leveling and grading, lifting, towing and general utility.

Enter 510 on Reader Card

STERLING ELECTRIC MOTORS, Inc. has released a comprehensive motor catalog covering the company's line of motors. The illustrated 56-page catalog includes complete pricing and dimensional data on motors ranging from ¼ to 200 hp. Information is included for various modifications, such as specialized mountings and enclosures. A special section is included that deals with motor selection.

Enter 511 on Reader Card

CALUMET STEEL CASTINGS CORP. has recently published a replacement parts handbook consisting of detail drawings of many typical cement plant castings produced. Among other parts shown in the handbook are cement

QUICK—COMPLETE SOURCE CONTACTS FOR ROCK PRODUCTS PRODUCERS
on Machinery—Equipment—Supplies—Service

- | | | | | |
|-----------------------|-----------------------|-----------------------|------------------------|---------------------|
| Aftercoolers, Air | Buckets | Drilling Accessories | Grinding Media | Shovels, Power |
| Agitators | Bulldozers | Drills | Gypsum Plant Machinery | Speed Reducers |
| Aggregates (special) | Cars, Industrial | Dryers | Hard Surfacing | Tanks, Storage |
| Air Compressors | Classifiers | Dump Bodies | Materials | Tires and Tubes |
| Asphalt Mixing Plants | Clutches | Dust Collecting | Hoists | Torque Converters |
| Bagging Machines | Coal Pulverizing | Equipment & Supplies | Hoppers | Tractor Shovels |
| Bags | Equipment | Electric Motors | Kilns: Rotary, Shaft, | Tractors |
| Barges | Concentrating Tables | Engineering Service | Vertical | Trailer Dump Bodies |
| Belting, Conveyor | Conveyors | Consulting and De- | Locomotives | Trucks, Bulk Cont. |
| Elevator, Power | Crushers | signing | Lubricants | Trucks, Industrial |
| Transmission | Coalers | Explosives & Dynamite | Magnetic Separators | Trucks, Mixer Body |
| Belting, V-type | Cranes | Fans and Blowers | Mills | Trucks, Motor |
| Belt Repair | Derricks | Feeders | Pipe | Valves |
| Equipment | Dewatering Equipment, | Fifth Wheel Heavy | Pumps | Vibrators |
| Bin Level Indicators | Sand | Duty Special | Scales | Welding and Cutting |
| Bins and Batching | Diesel Engines | Flotation Equipment | Screen Cloth | Equipment |
| Equipment | Drillline, Cableway | Front End Loaders | Screens | Winches |
| Bits | Excavators | Gasoline Engines | Scrubbers: Crushed | Wire Cloth |
| Blasting Supplies | Draglines | Gear Reducers | Stone, Gravel | Wire Rope |
| Bodies, Trailer | Dredge Pumps | Generator Sets | | |

If equipment you are in market for is not listed above, write it in space below.

☐ Crushed Stone
☐ Sand & Gravel
☐ Slog
☐ Cement
☐ Lime
☐ Gypsum

☐ Ready Mix Concrete
☐ Concrete Products
 Type _____

Other nonmetallic mineral
 (What?) _____

All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired

☐ Have Salesman Call ☐ Literature only

☐ Prices ☐ By mail ☐ Urgent

NOTE: See—Where to Buy—Classified Advertising Section for used equipment and complete plant information

Name _____

Title _____

Firm _____

Street & No. _____

City and State _____

Your Signature _____ Title _____

FILL IN—TEAR OUT—MAIL NOW!

BUYER RESEARCH SERVICE DEPARTMENT: ROCK PRODUCTS 79 W. Monroe St.
Chicago 3, Illinois

cooler and dryer nose rings and feed end segments, recuperators, kiln feed end segments and burner tips. In addition, a variety of other cast steel parts for high-temperature service in cement plant equipment is also illustrated.

Enter 512 on Reader Card

Hydraulic dredges



MECKUM ENGINEERING, INC. has released a bulletin covering the company's line of sand and gravel dredging equipment. Included in the illustrated brochure are details concerning the company's hydraulic dredges, chain cutter ladders, rotary cutter ladders, sectional steel hulls, and dredge and material handling pumps.

Enter 513 on Reader Card

Crusher bulletin

UNIVERSAL ENGR. CORP. has issued a new bulletin that points out that the combination of the company's matched jaw crusher plus "systemized" screening accounts for the tremendous tonnages. The crusher with its two moving jaws in a single crusher, force feeds, crushes and forces discharge.

Enter 514 on Reader Card

Stationary compressors

A NEW BULLETIN describing its line of industrial rotary stationary compressors, is announced by Davey Compressor Co. Contents include specifications for compressors of 20 to 125 hp., and units are offered with both air- and water-cooled oil coolers.

Enter 515 on Reader Card

Size and weight booklet

A NEW 70-PAGE BOOKLET authentically describing truck and trailer size

and weight restrictions throughout the U. S. and Canada has been prepared by the FWD Corp.

The company first printed the size and weight restriction booklet in 1933. It is the first time Alaska and the Canadian provinces have been included.

Enter 516 on Reader Card

New truck line

DODGE DIVISION of Chrysler Corp. is distributing literature on its line of light, medium and high-tonnage trucks. On the heavy-duty models, wide-swinging front fenders and hood give

top accessibility. Choice of engines, transmissions and axles gives the producer a truck to match his needs, the literature indicates.

Enter 517 on Reader Card

56-hp. crawler tractor

INTERNATIONAL HARVESTER Co. has distributed a catalog on its new 55.7-hp. TD-9 crawler tractor. Features include five-roller track frame, five forward-speed and one reverse speed transmission and new 500-hr. lubrication period track rollers.

Enter 518 on Reader Card

END

240 TONS PER HOUR!
243,000 TONS IN 9 MONTHS!
6 "SET-UPS" } 5 State jobs and 1 City job required 6 different plant "set-ups."
Distances between "set-ups" varied from 8 miles to 540 miles.

...reports Mark C. Whiting, President of
Whiting Bros. Const. Co., Inc., Las Vegas, Nevada



Figures like these tell a story. They indicate the tremendous output of the MADSEN Model 481 5000-lb. Asphalt Plant over a period of months on various Federal and State Specification mixes... the kind of day-in and day-out tonnage that builds owner profits.

They tell of the easy, low-cost maintenance and economical operation of the MADSEN Model 481. (Downtime in the 9 months period was only 12 hours.)

They show how the unit construction of the MADSEN Model 481 pays off in ease of portability and fast, easy set up and dismantling.

And most important, they show that the MADSEN Model 481 Asphalt Plant gives you the advantages you need to make greater profits in today's fast-moving asphalt mixing business. Check with your MADSEN Distributor.



1910 - 1960 50 YEARS - SERVING INDUSTRY

Complete parts stock in
Los Angeles and Lima, Ohio

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Construction Equipment Division
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BALDWIN-LIMA-HAMILTON CORPORATION, LIMA, OHIO



Enter 1044 on Reader Card

You can save money by using this New 50 DUPLEX* PRIMACORD®

... wherever you are now using conventional 150-175 grain nominal coreload detonating fuse as sole initiator for certain types of uncoated AN-Fuel Oil mixtures



Extensive testing has established enhanced directional initiating strength from the twin cavities of the Figure 8 cross-section.

New 50 DUPLEX Primacord consists of two 50-grain Primacords laid side by side and covered with a bright red plastic jacket. This construction develops a Figure 8 cross-section of the two cords forming two opposing V-shaped cavities which run beneath the jacket for the full length of the cord. This construction provides directional initiating strength effectively equivalent to that of 150-175 grain nominal coreload detonating fuse with single core.

Primacord	Total Coreload	Major O.D.	Minor O.D.	Tensile Strength	Weight (Per M Ft.)
50 DUPLEX	100 Grain $\pm 10\%$.323" $\pm .008$ "	.178" $\pm .008$ "	170 lbs.	24 lbs.

Advantages of 50 DUPLEX PRIMACORD

Less expensive than either the 150 or 175 grain detonating fuse with single core.

More flexible and lighter in weight.

Furnished in 500-ft. lengths. Does not need end seals — can be cut and applied in the field as easily as the standard types of 50-60 grain Primacord.

Easier to connect to Primacord trunklines with tight knot connections.

50 DUPLEX PRIMACORD is initiated with fuse and cap or electric blasting caps, or through proper knot connections to trunklines of Plain, Reinforced or Lo-Temp Primacord.

Warning: 50 DUPLEX PRIMACORD is recommended as the sole means of initiation only for certain types of uncoated prill-oil mixtures, or wherever 150-175 grain nominal coreload detonating fuses with single cores are now being used *successfully* for direct initiation of such mixtures. In case of doubt consult your explosives supplier or communicate with this company.

The ENSIGN-BICKFORD COMPANY

Simsbury, Connecticut • Since 1836

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READER-SERVICE CARD

RP-8-60

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79 W. Monroe St.**AUGUST, 1960**
Chicago 3, IllinoisCannot be serviced after
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List your choice in numerical order. Limit 10 per card.

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(6) _____ (7) _____ (8) _____ (9) _____ (10) _____

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There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.



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(6) (7) (8) (9) (10)

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There is a wealth of valuable information in the manufacturers' booklets offered in this issue. For your convenience, each advertisement, each new machinery and new literature item has been given a key number. Simply fill in the proper key number in the appropriate space on the card above and send it to us. We'll do the rest.





TAPER-LOCK STEEL CONVEYOR PULLEYS

Maximum strength with minimum weight...

Unmatched holding power on the shaft...

New mounting simplicity.

The rims, discs and hubs of these modern conveyor pulleys are *steel*—and they are fused together into jointless drum construction for (1) maximum strength with minimum weight, (2) exclusion of dirt, water, steam, (3) terrific shock resistance.

With the patented Dodge Back-up Bar, welds of full rim thickness are achieved—and the ultimate in strength is assured by submerged arc process welds.

Taper-Lock Steel Conveyor Pulleys *hold*. Taper-Lock provides the equivalent of a shrunk-on fit—there is no "walking" on the shaft. Mounting and demounting are simple. Pulley and bushings mount as a unit. Alignment is easy. And the tapered bushing is wedged into place merely by turning the mounting screws. It is "unlocked" by using the mounting screws as jack screws.

Available in diameters from 6 inches to 8 feet—all face widths. Standard or special rubber lagging available. Ask your local Dodge Distributor—or write us for bulletin.

DODGE MANUFACTURING CORPORATION, 2600 Union, Mishawaka, Ind.



97 Taper-Lock Steel Conveyor Pulleys are used in this famous conveyor system engineered, manufactured and erected by Hewitt-Robins, Inc., at the Southern Pacific's causeway construction across the Great Salt Lake.

DODGE

→ of Mishawaka, Ind.



CALL YOUR TRANSMISSIONEER—your local Dodge Distributor. Factory trained by Dodge, he can give you valuable help on new, cost-saving methods. Look under "Dodge Transmissioneer" in the white pages of your telephone directory, or in the yellow pages under "Power Transmission Equipment."

Enter 1060 on Reader Card

NEW PATENTS

by OLIVER S. NORTH

RECENTLY ISSUED PATENTS ON NONMETALLIC MINERALS*

Cement

Canadian 597,094—Improved apparatus for flash preheating of **portland cement** raw mixtures in suspension in a stream of hot kiln gases. (to L. Petersen; assigned to F. L. Smidth & Company)

Canadian 597,337—Design for an improved rotary grate apparatus for cooling **portland cement** clinker immediately after it is discharged from the rotary kiln. (to H. Habel; assigned to VEB Zementanlagenbau Dessau.)

British 833,071—In a method for making **hydraulic cement** wherein the clinkering operation is omitted, a proportioned mixture of lime, silica and iron oxide is ground together until the minor amount of grinding heat has caused reaction between the components of the mixture. (to J. J. Coney)

British 833,477—In an improved method for cooling **portland cement** clinker, air is forced upwardly through the feed end of the travelling grate at such a high pressure that the material is whirled into the air and spread uniformly across the width of the grate. (to G. Hagermann, B. Helming and W. Breves; assigned to Polysius G.m.b.H.)

British 833,752—Design for a pneumatic apparatus for cooling pulverized, or "finished," **portland cement**. (assigned to Polysius G.m.b.H.)

British 834,052—Method and apparatus for feeding powdered coal into the firing end of a **portland cement** kiln in such a manner that the rate of flow is uninterrupted and controllable. (to E. C. Schmitt)

Australian 223,738—In a vertical kiln for producing **portland cement**, a means is provided for introducing an auxiliary air supply proceeding from the top of the kiln in countercurrent flow to the air stream introduced at

the bottom of the kiln. A fuel of high volatile content may be used. (to S. Gottlieb; assigned to Gorresen's Pty.)

Phosphate rock

U. S. 2,936,888—In a process for removing suspended solid impurities from slurries obtained by the aqueous leaching of acidulated **phosphate rock**, the solution is rapidly cooled and then subjected to centrifugal separation, with or without employment of auxiliary flocculation or clarification reagents. (to W. B. Williams; assigned to International Minerals & Chemical Corporation)

U. S. 2,937,069—Method for rapidly restoring to operating condition polyethylene filter cloths blinded by accumulations of solids during filtration of wet process phosphoric acid produced by acidulation of **phosphate rock**. The cloth is immersed in a solution of hydrofluoric acid, whereby the calcium sulfate anhydrite is dissolved. (to J. H. Zoellner; assigned to International Minerals & Chemical Corp.)

U. S. 2,938,629—Design for a simple, low-cost, high-capacity pneumatic machine for the flotation concentration of phosphate values from **phosphate rock**. Water containing entrained air is introduced under pressure at the bottom of the cell so as to keep the mineral pulp continually in motion. (to C. A. Hollingsworth and C. J. McDonald; assigned to Smith-Douglass Co., Inc.)

Vermiculite

U. S. 2,938,937—An insulating compound for spraying onto metal parts of rockets or missiles consists of **asbestos**, exfoliated **vermiculite**, a fire-resistant hydrocarbon-rubber vehicle, a plasticizer, a pigment and an aromatic solvent. (to A. M. Shenk; assigned to Ideal Chemical Products)

U. S. 2,939,794—An asphaltic coating composition for protecting utility poles, railroad ties, wharves and pilings, etc., from weather and fire consists of 30-55 percent asphalt, 15-30 percent a volatilizable diluent, 5-15 percent fine **asbestos** fiber, 5-10 percent ground **mica**, 5-15 percent exfoliated **vermiculite** and 2-8 percent of a fine alkali metal borate. This compound is applied by brushing, spraying, or troweling. (to C. E. Wilkinson; assigned to Texaco Inc.)

Canadian 597,718—An air-blown cutback type asphaltic protective coating composition consists of a specified air-blown petroleum asphalt base, a solvent therefor, exfoliated **vermiculite**, and 7M or 7T **asbestos** fiber. (to A. J. Hoiberg and C. E. Cowger; assigned to Monsanto Chemical Co.)

Clays

U. S. 2,937,815—Design for a disc mill useful in the milling of **clay** of stiff plastic consistency, such as highly plastic bonding clays. (to W. Eirich and G. Eirich)

U. S. 2,938,233—Method for coating pellets of rosin, resin, wax, ammonium nitrate and the like with **attapulgit** or other clay. (to H. Nack and G. F. Sachsel; assigned to G & A Laboratories, Inc.)

U. S. 2,938,818—An additive to smoking tobacco for the removal of tars during smoking thereof consists of a mixture of hydrated **lime** and acid activated **kaolin**. (to C. A. Specht; assigned to Minerals & Chemicals Corp. of America.)

U. S. 2,939,764-5—In a method for removing silica from **kaolin** and other clays, **pyrophyllite**, etc., the material is calcined, extracted with sodium hydroxide, and then filtered to remove sodium silicate and leave an upgraded alumina-bearing residue. (to H. Schoenfelder and H. Ginsberg; assigned to Vereinigte Aluminium-Werke A.G.)

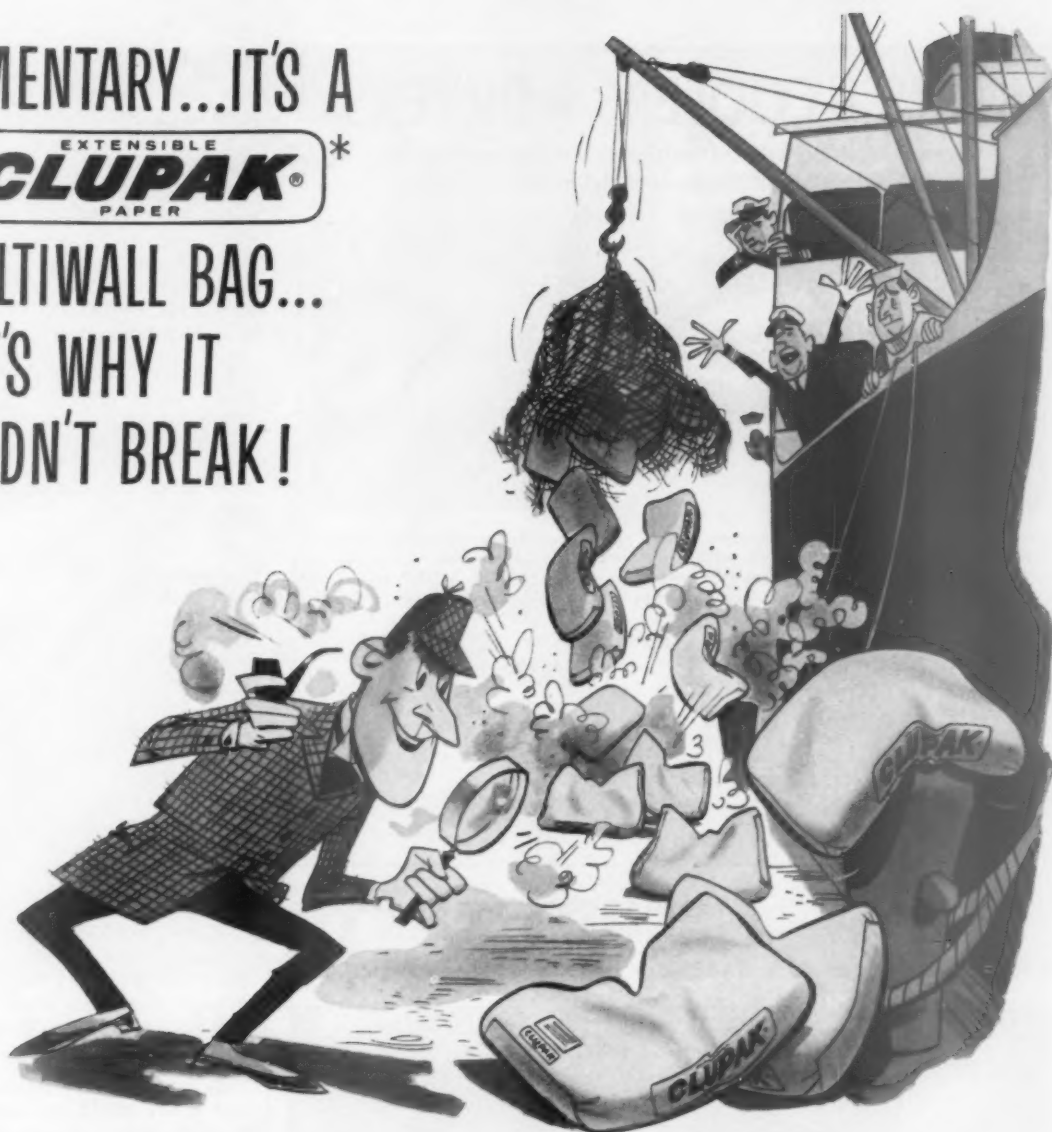
(Continued on page 158)

*Copies of United States patents are available at a cost of 25 cents each (photostat copies of foreign patents at 50 cents per page) from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of \$5.00 per 20-coupon pad or \$25.00 per 100-coupon pad.

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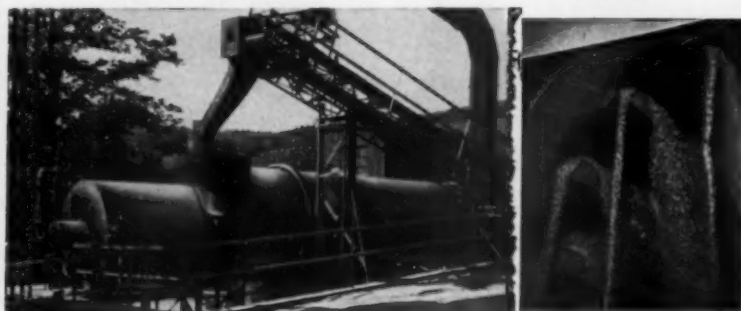


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GETMAN BROTHERS

SOUTH HAVEN,
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NEW PATENTS

(Continued from page 156)

Mica

U. S. 2,937,149—A composition for use in the removal of corrosion from metal surfaces or articles comprises 25-35 percent phosphoric acid, 50-55 percent wet-ground **mica**, a small amount of a wetting agent and water. (to S. Hilton; assigned to E. & A. West)

Canadian 598,252—A sheet material of enhanced strength is made by curing a composition consisting of **mica** flakes, polybutadiene and di-alpha-cumyl peroxide. (to M. M. Safford and E. J. Smith; assigned to General Electric Co.)

British 834,182—Use of **bentonite**, powdered **mica** or pulverized **talc** in a sealing composition for electric cables. (assigned to Compagnie Generale d'Electricite)

Aggregates

U. S. 2,938,230—Improved apparatus and method for pelletizing a continuously formed clay strip for subsequent heating to produce an **expanded clay** lightweight aggregate product. (to C. L. Sainty; assigned to Structural Concrete Components Ltd.)

U. S. 2,938,675—Design for a multi-compartment crusher for both primary and secondary crushing of rock or stone to produce **crushed stone**. (to A. G. Cushman; one-third assigned to J. F. Cushman)

U. S. 2,939,693—Improved method and rotary kiln for producing an **expanded slate** lightweight aggregate. The kiln is relatively small, but efficient, and the temperature can be very closely controlled. (to A. F. Old and R. F. Gibson; assigned to Solite Corp.)

Asbestos

U. S. 2,937,101—Use of **asbestos** fiber in the manufacture of a chemically inert heat resistant material having high thermal shock resistance, and of particular utility as an outer fabric for high speed aircraft. (to R. A. Nelson and S. Zirinsky; assigned to General Electric Co.)

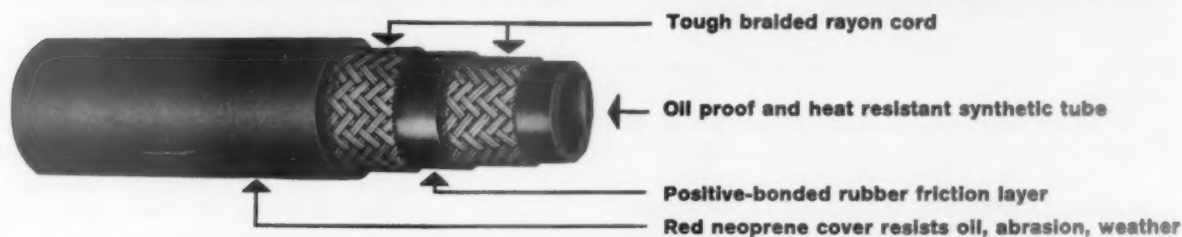
U. S. 2,939,247—Method of making fungi-and-algae-resistant greenhouse planters, pots, etc., from either ceramic materials or mixes of **asbestos** fiber and **portland cement**. (to H. J. Palumbo; assigned to Johns-Manville Corporation)

END



Quaker
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VERSICON
All-Purpose Hose

The hose that wears like a truck tire!



Work like this is rough on hose, but Thermoid-Quaker "Versicon" takes it in stride. "Versicon" hose is built for high air pressures, up to 300 psi. It's built to withstand dragging over jagged, abrasive rock. It resists oil, baking sun or freezing cold. It's the heavy gauge, tough neoprene cover that takes this kind of surface abuse.

The tough braided rayon reinforcement gives it the extra strength to withstand high working pressures.

The tube is a specially compounded synthetic that's

oil proof, heat resistant and will not flake or chip.

"Versicon" is made in all sizes up to 1½" and in lengths up to 500' in some sizes. Also in one, two or three braid constructions for use with water, oil, grease, solvents, sprays and mild chemical solutions.

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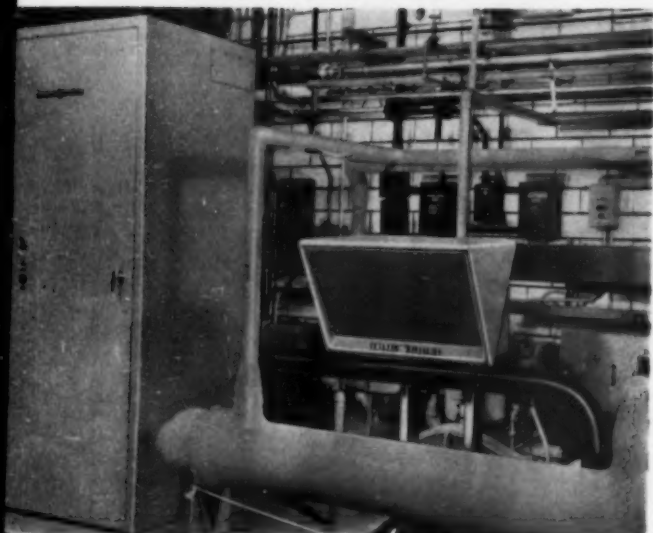
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ROCK PRODUCTS, August, 1960

159

NEW MACHINERY

FOR FREE INFORMATION on these items, simply fill out and mail postage-paid Reader Service Card found elsewhere in this issue



X-ray analyzer

Continuous, production-line analysis of the elements present in fine powders is now possible with a newly developed X-ray emission gauge. As it measures as many as five elements, the new instrument produces a signal that can be recorded graphically or fed into recorders, data loggers or computers.

One of the first practical applications will be to analyze kiln-feed mixes in dry process portland cement plants. The device can sense and measure aluminum, calcium, silicon and iron in the stream of minus 200-mesh materials coming out of ball mills or out of kiln-feed silos. The time lag in the analysis ranges from $\frac{1}{2}$ to 20 min., depending on the atomic number of the element to be measured and the level of accuracy desired. Ordinarily, aluminum is the lightest element measurable on a continuous basis. This eliminates sodium and magnesium from cement mix control at the present time.

A measuring head on the pipeline of material and a control cabinet make up the new instrument. The heavy, rugged head casting houses an X-ray tube, collimation slits, analyzing crystals, counter tubes and preamplifiers. Fine adjustment of the

counters and crystals is made outside the head. The head itself is mounted on a special powdered material presenter in the pipeline carrying a continuous sample of the main stream. This section provides an opening that permits X-rays to penetrate into a sample from the flow of material. To accurately measure the radiation from the light elements normally present in cement mixes, the head must be purged with helium.

The dustproof control cabinet houses and mounts all of the power and measuring components. While the cabinet is accessible front and back, the doors are kept closed and locked for normal operation.

The new X-ray emission gauge is completely safe, according to the manufacturer. The X-ray tube and the scattered radiation it produces are completely enclosed within the head. X-rays outside the head are less than $\frac{1}{2}$ mr. per hr. The radiated samples returned to the stream of material do not become radioactive: There is no measurable residual radiation in the finished kiln feed. The sealed head and locked doors of the control cabinet prevent any but authorized personnel from working on the adjustable components inside. (General Electric Co., X-Ray Dept., Milwaukee 1, Wisconsin)

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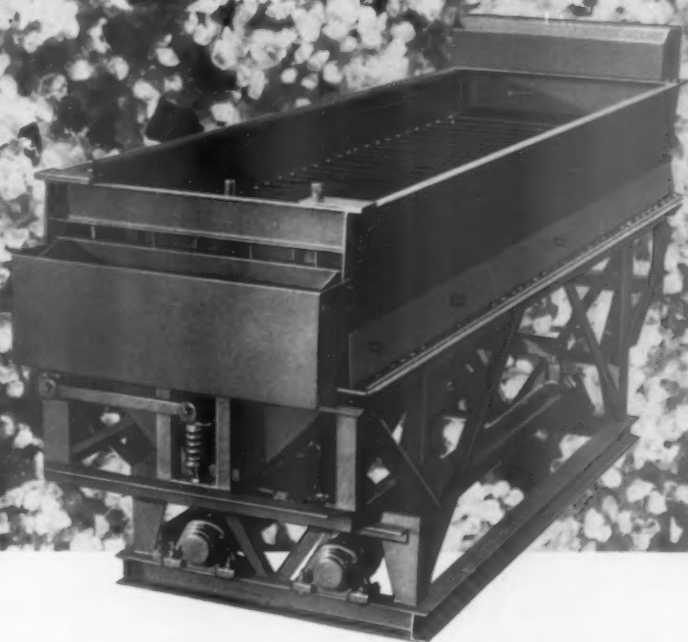
Laboratory magnetic separator

A rotating-field, variable-flux magnetic separator is available for laboratory work to take out magnetic particles from silica sand and other dry mixtures. This is an underfeed unit that pulls magnetic particles counterflow to the direction of feed. The maker states that this principle turns over the flow of material to expose more material to the field of the magnetic drum.

Model RF-1660 is made of alloy aluminum and non-magnetic stainless steel. While the machine was designed as a laboratory tool, its capacity of up to 600 lb. an hour would make it suitable for continuous production for several applications to remove iron contamination. (Carpco Mfg., Inc., 4120 Haines St., Jacksonville 6, Fla.)

Enter 101 on Reader Card

Please turn to page 162



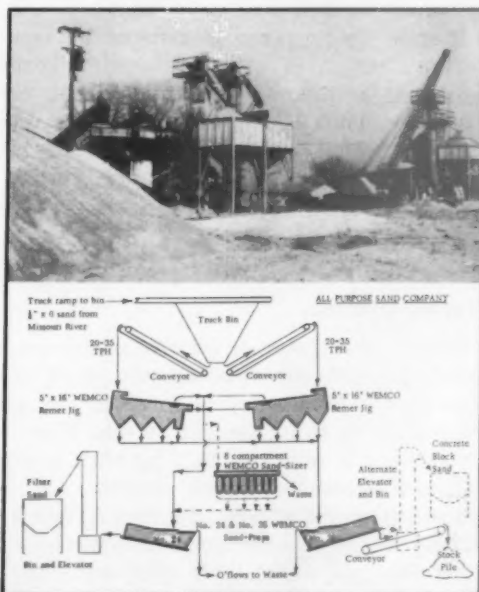
SOLUTION OF "UNSOLVABLE" PROBLEM:

Wemco-Remer Jigs profitably separate fine coal from sand!

In the St. Louis area, lignite, or fine coal, in sand deposits has long been an "unsolvable" problem—an obstacle to profitable production of specification sands.

But All-Purpose Sand Company, of St. Louis, found the answer. "The Wemco-Remer Jigs *did it!*", in the words of Mr. Kenneth Wikowsky, partner and vice-president. In a plant designed by Marsh Engineering Company, and incorporating two Wemco Sand-Preps, the company now removes all lignite coarser than 1/16" and a majority of finer fractions, thus meeting specifications for concrete sand, filter sand and blasting or traction sands in the area.

All-Purpose is another example of how Wemco equipment and modern beneficiation techniques enable the industry to produce higher quality products—for greater profits.



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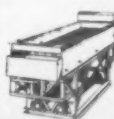
SAND-SORT



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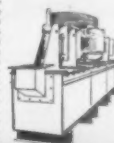
MOBIL-MILL
(HEAVY MEDIA
SEPARATION)



SAND-SIZER



SAND-SCRUBBER



PUMPS



NEW MACHINERY

continued from page 160



Two-way radio

Improved communications for rock products producers is offered with a newly developed two-way radio. The new system is probably the highest-powered transistorized radio communication system to be offered for mobile use. The 100-watt package will be available in low band frequencies.

Small size features the new radio. It is 4 in. high, 8 $\frac{5}{8}$ in. wide and 15 in. long. Normally, the whole unit can be mounted under the dashboard in most trucks or cars. But it can be mounted in two sections to fit into close quarters.

Despite the increase in power, the new radio system draws very little power when sending or receiving. In this way it is possible to operate the system without excessive drain on the battery with the vehicle engine turned off. (General Electric Co., P. O. Box 4197, Lynchburg, Va.)

Enter 102 on Reader Card

Wet air scrubber

Where dust, fume or odor is a problem, a new highly efficient wet scrubber may prove to be the answer. The Hydro-Volute Scrubber has achieved efficiencies up to 99 percent on fine, abrasive materials, and it is not limited by high moisture or high temperature of the air stream.

Capacities are offered in a range from 1,000 to 60,000 cfm. The exceptional compactness of the units does not affect their efficiency. Cost of the new scrubber is said to be 20 to 40 percent less than other scrubbers of the same capacity.

Heavy dust loading, high capacity or high temperatures require a settling pond in the water flow system. Smaller requirements permit either manual, hydraulic or mechanical removal of sludge. (The Johnson-March Corp., Philadelphia, Pa.)

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Bin vibrator

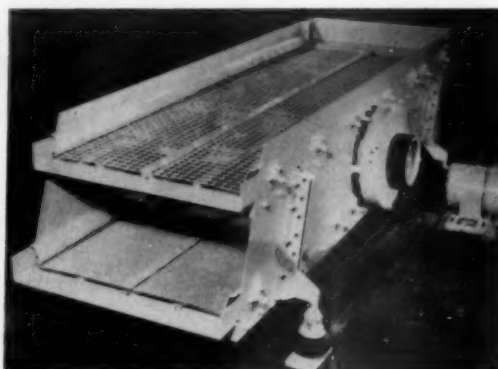
A big, new double-impactor bin vibrator has been developed for heavy-duty applications. It is recommended for use on bins or hoppers holding up to 20 tons of heavy granular, lumpy or powdered materials. The new 60-U, largest unit in the manufacturer's line, delivers 7,200 impacts a min. and will work effectively on bins made with steel up to $\frac{3}{8}$ -in. thick.

No control is needed for the majority of applications where 115 to 575 v. 60 cy. alternating current is available. However, the use of a control permits deflection adjustment.

The unit is housed in a cast iron base with four mounting lugs. Side lugs adjacent to the impact area provides maximum contact and optimum transmission of vibration to the bin walls. (Eriez Mfg. Co., Erie 6, Pa.)

Enter 104 on Reader Card

Vibrating screen



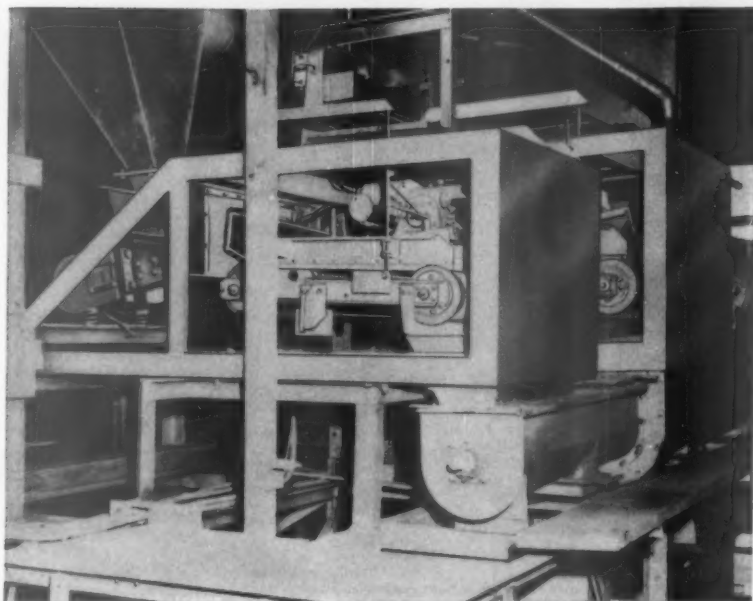
A new two-bearing, unbalanced shaft type vibrating screen offers the rock products producer screen economy in a rugged, durable unit. It features modular components that can be assembled into screens of different sizes, thus achieving manufacturing economies. The new line of screens has been named Ty-Rocket.

The new screens will be available in a range of standard sizes from 3 x 6 ft. to 6 x 16 ft. in one, two or three-deck models. All may be floor-mounted using air-spring suspension, or ceiling-mounted with cables and springs. A universal bracket is simply reversed to change the method of mounting, while the angle of inclination of the screen may be changed merely by changing the location of the brackets. (The W. S. Tyler Co., 3615 Superior Ave., Cleveland 14, Ohio)

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Please turn to page 164*

SYNTRON cost-cutting equipment of proven dependable Quality

provide accurate, continuous
flow feeding by weight



SYNTRON Weigh-Flow

GRAVIMETRIC FEEDERS

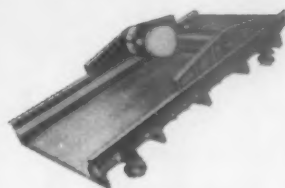
—are designed for the accurate, dependable weigh feeding of bulk materials. They offer extremely high accuracies, either electronic or impulse control, wide ranges capacities from a few pounds to 100 tons per hour. Industrial applications are almost unlimited—batch weighing, controlled feeding, blending, weight checking production line output, weighing in coming and outgoing bulk materials and many other weigh control of bulk materials uses.

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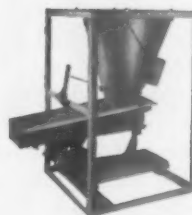
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ROCK PRODUCTS, August, 1960

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NEW MACHINERY

continued from page 162



Explosives tester

A pocket size field tester for electrical detonating accessories has been developed that performs the same functions as testers several times larger. Weight of the new unit is less than a pound and it can be held and operated in one hand.

The new tester uses a sensitive bridge circuit: maximum test current is limited to 10 milliamperes. There is no danger of setting off igniters during the test, according to the maker.

A simple digital readout indicates whether the device being tested will fire or misfire. This can be compared with the manufacturer's specification for resistance. By checking the operability of electrical blasting accessories, blasting efficiency can be improved, quarry safety increased and loss of costly blasting materials can be avoided. (Kinetics Corp., 410 S. Cedros Ave., Solana Beach, Calif.)

Enter 106 on Reader Card

New shovel

A new, $\frac{3}{4}$ -cu. yd. shovel has been announced that can be converted to crane, dragline or clamshell. This adaptability expands its usefulness to a producer with a number of different jobs to be done.

Exclusive features offered in the new Model 1220 include a one-piece, cast casing enclosing all gears and shafts that operate in a bath of lubricant; rugged, all-welded turntable; in-line mounting of either gasoline or diesel engines, and a brake that offers 50 percent more braking ability.

Disc clutches are mounted on high-speed countershafts for smoother operation and power, according to the maker, while a torque converter provides instant and accurate control. An independent boom hoist permits powered raising and controlled lowering at high speed. (Unit Crane & Shovel Corp., 6411 W. Burnham, Milwaukee, Wis.)

Enter 107 on Reader Card

Worm reducers

A new line of fan-cooled worm reducers is available in two mounting styles to give the user maximum mounting flexibility. Radicon reducers come with fixed bases or adaptable bases, with the adaptable base easily secured to either the bottom or the top of the reducer housing. All adaptable-base units have the additional feature of a drywell cover on the output shaft. This prevents oil in the housing from mixing with grease in the output shaft bearings when the unit is mounted vertically with the slow-speed shaft projecting downward.

The new units are available in a wide range of ratios, in 12 sizes from $1\frac{1}{8}$ to 8 in. and in ratings up to 66 hp. With finned housings and high-velocity cooling air, the thermal ratings equal the mechanical ratings for most applications. Cooling is said to be equally efficient at any mounting position. (Foote Bros. Gear & Machine Co., 4545 S. Western Blvd., Chicago 9, Ill.)

Enter 108 on Reader Card

Torque control

This new device permits motors to be selected closer to the power requirements of running loads rather than to the extra power needs of high-inertia starting loads. The maker claims that expensive motor starters and control systems can be eliminated while the motor is protected from overload at reduced starting speed.

Power-Max combines an automatic clutch, adjustable torque selector and time delay device. Both the transmitted torque and the time to pick up the load can be readily adjusted. As a result, the torque-limiting device can be adapted to suit the load characteristics of the driven equipment.

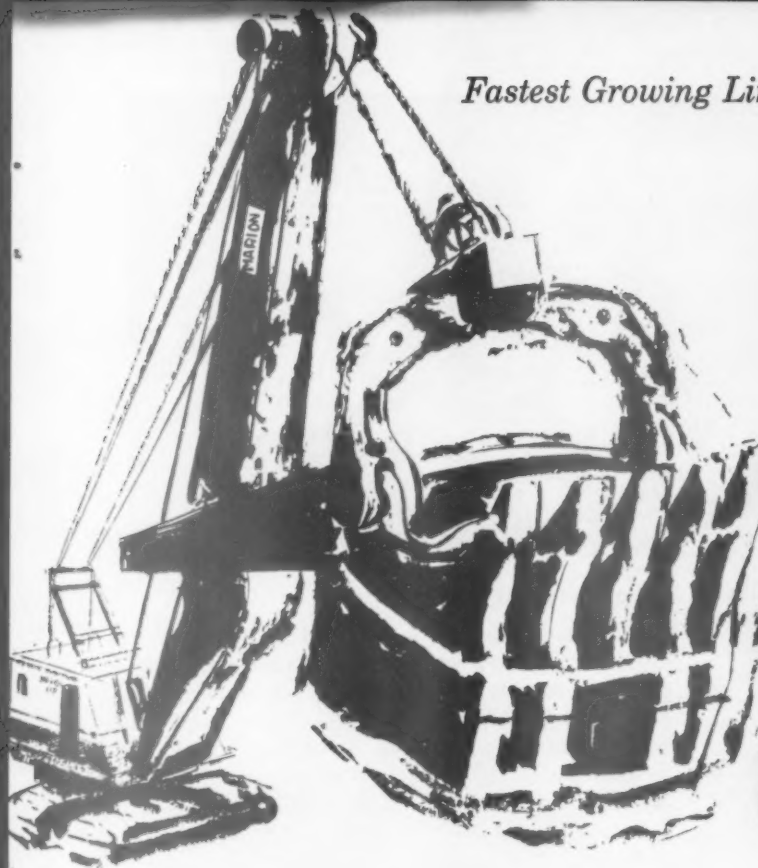
The new unit is offered for typical rock products applications where heavy machinery must be started under different loading situations, from completely empty to overloaded—and for a wide range of conditions in between. Typical rock products installations include belt conveyors, bucket elevators, crushers, ball mills and rotary kilns.

The torque-limiting clutch is offered in sizes from 3 to 2,000 hp. and in a variety of types for direct drives, flat belt transmission, multiple V-belts and other overhung applications. The unit can be made an integral part of a flexible coupling, drum or other driving machinery. Since it operates in either direction of rotation, the motor can be reversed to operate as a dynamic brake without damage to the drive. (Olme Precision, Inc., Portsmouth, Ohio)

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Please turn to page 166

Fastest Growing Line in The Industry



COMING AT YOU FOR THE SIXTIES!

THE NEW MARION 111-M

From crawler to boompoint sheave, today's Marion 111-M is, pound for pound, the finest excavator in the world. It's 80 ways better than its predecessors for the BIG jobs of the Sixties. For example:



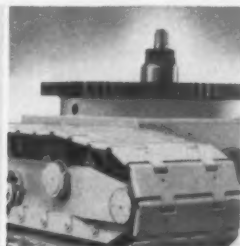
- Standard boom length increased from 50' to 80' . . . lifting capacities up over 25%!



- Shovel boom weight increased 38%, promising a rugged front end that will keep digging under the most adverse conditions!



- Where it counts! Shovel capacity up over 40%!



- Lower frame and crawler assembly substantially heavier for toughest rock work!



- Increased rear swing radius for improved machine stability, bigger shovel and crane capacities!

What this machine could do yesterday . . . it does faster and better today. If your needs are for a mobile, fast-cycle, low-maintenance excavator that balances with modern haulage units for more profitable construction work, look to the Marion 111-M. It's THE machine in its class.

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Write today for Bulletin No. 457 which tells the full, dramatic story of the new Marion 111-M.

NEW MACHINERY

continued from page 164

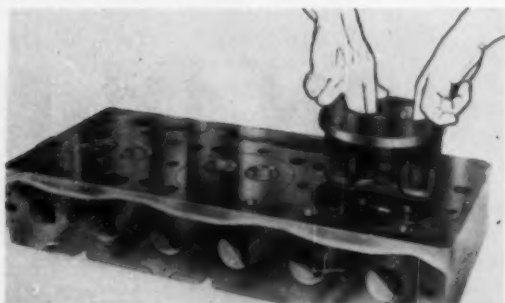
High-lift pump

Four new series of deep well pumps offer the producer up to 500 gpm., lifts up to 1,000 ft. and up to 50 psig. pressure at the well head. This pumping capacity can be achieved at half the speed of conventional deep well pumps, according to the manufacturer.

The Hi-Lift pump series uses a positive displacement pumping action. A corkscrew-shaped rotor within a contoured stator section literally squeezes water upward in a constant volume. The rotor is chrome-plated stainless steel while the stator is made of rubber. As a result, it is possible for the new pumps to handle sandy slurries with a minimum of abrasive wear of the elements of the pump. (Peerless Pump, Hydrodynamics Div., Food Machinery & Chemical Corp., Los Angeles 31, California)

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Diesel cylinder head

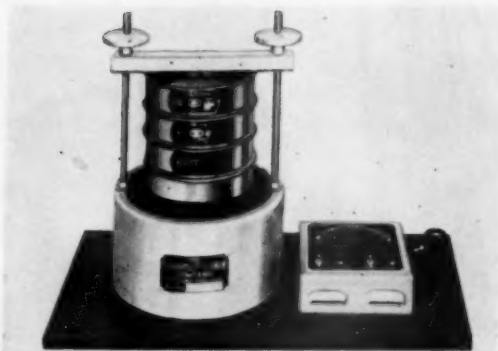


A cylinder head of unusual design is offered to replace conventional heads in the diesel engines of trucks, earthmovers and other heavy-duty applications. Its makers feel that the new design will improve the fuel efficiency, retain the full power and assure peak valve performance in diesel engines between major overhauls.

The new Stres-Fre head allows the hot spot combustion area and the cylinder head to expand and contract independently without built-in resistance. This eliminates the stresses said to cause cracking of heads and blocks and damage to valve seats—conditions that occur even when the engine is operating under optimum temperature and power conditions.

Each individual head section can be replaced with the new head without replacing the complete assembly. It is guaranteed against combustion chamber cracking for three years. (Stancliff Engineering, Inc., 1001 22nd St., Bakersfield, Calif.)

Enter 111 on Reader Card



Laboratory test screen

Fine, fast screening is featured in this new 8-in. laboratory testing screen. Dry granular materials can be screened down to 400 mesh, according to the manufacturer. The CDP circular screening unit is said to be unusually quiet in operation and is light enough to be carried by one man. There is no vibration or movement of the base and it can be set up on a table or any convenient location.

Pulsating action is provided by two independently driven rotating shafts. Each motor is rheostat-controlled so that it can be changed to suit the screening characteristics of each material to be tested. The pulsating action produced by this drive is said to screen most materials practically instantaneously and to prevent build up of fines on the screens. (The C. O. Bartlett & Snow Co., 6200 Harvard Ave., Cleveland 5, Ohio)

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Electrostatic precipitator switch

A new, high-voltage, low-current switch has been designed to meet the unusual power requirements of electrostatic precipitator operation. The double-bladed switch is conservatively rated at 100,000 v. and 1 amp. It can be operated under load, if necessary, and can withstand the brief but extremely steep feedbacks typical of precipitator operation. According to the manufacturer, the switch may be used for other equipment having the same operating characteristics.

The switch is a multi-deck rotary type and can operate in all kinds of insulating oils. If housed in its own compartment, it takes about 1 cu. yd. of space, a fraction of that needed by an air switch. This gives the advantages of shielding the switch from corrosive or abrasive air-borne dust and personal contact. (Buell Engr. Co., Inc., 123 William St., New York, N.Y.)

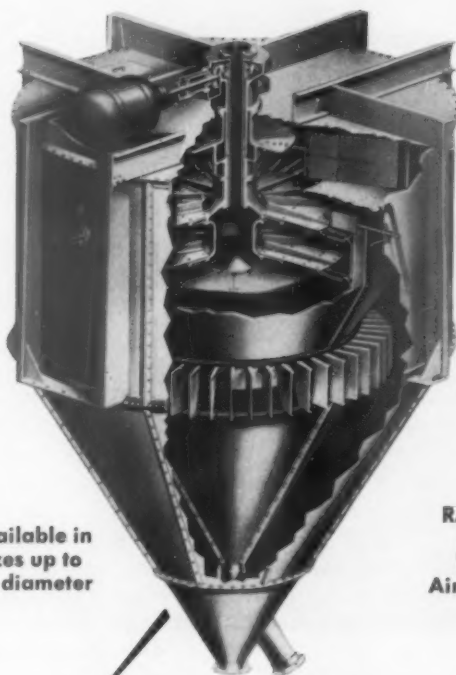
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Please turn to page 168

PREMIUM PRODUCTS

MADE BY RAYMOND

Whizzer **AIR SEPARATION**



Available in
sizes up to
18' diameter

**RAYMOND
Double
Whizzer
Air Separator**

The star performance of Raymond Whizzer Separators is due to their advanced design, as described in Bulletin #76. Write for your copy.

Exclusive new features in the latest model Raymond Mechanical Air Separator give the extra efficiency you need for meeting today's maximum cement specifications.

It does an excellent job in the non-metallics field for the uniform fine separation of cement, both raw mix and finished cement, as well as lime, gypsum and similar materials.

When operated in closed circuit with a grinding mill, it greatly increases output of the combined system.

- The Whizzer principle gives sharper separation with higher recovery of fines, and also provides wide range classification to 99.9% minus 400-mesh materials.
- The extra large powerful fan develops maximum capacity rating of the separator.
- Increased size of frame members gives added strength and stability.
- Vertical slide dampers simplify fineness control, and provide flexibility in changing from standard grades to high early strength cements.
- Improved lubrication system insures new economies in operation and maintenance.

Whatever your plant capacity requirements, there is a suitable size Raymond Separator to meet your needs.

COMBUSTION ENGINEERING, INC.

427 W. RANDOLPH ST.
CHICAGO 6, ILLINOIS

Raymond Division

SALES OFFICES IN
PRINCIPAL CITIES

Combustion Engineering-Superheater Ltd., Montreal, Canada

NEW MACHINERY

continued from page 166



Vibratory feeder

This new vibratory feeder has been developed for heavy-duty applications in the rock products industry. Rated at 75 tph., the 75-A feeder can handle sand, gravel, crushed stone and other granular materials over a wide range of sizes and gradation. The parts of the feeder are completely enclosed to protect them against dust or moisture, common hazards in the industry.

Five standard sizes are available in flat or tubular design. They are of all-welded construction in carbon or stainless steel. Other sizes and shapes can be supplied. The electro-permanent magnet drive operates direct from ac. current and needs no rectifier. Controls are supplied to vary the applied line voltage to provide quick, accurate adjustment of the feed rate. (Eriez Mfg. Co., 1945 Grove Dr., Erie 6, Pa.)

Enter 114 on Reader Card

Bridle hitch clamp

A new fitting for $\frac{5}{8}$ or $\frac{3}{4}$ -in. wire rope provides a quick way of attaching a load to a bridle cable. The three-part fitting consists of a wedge clamp, wedge and cable clip.

The clamp holds the load securely on the bridle, and its saddle groove provides smooth transfer of the transverse load. A pin connection in the clamp allows a sheave or block to be attached. (Sauerman Bros., Inc., 630 S. 28th Ave., Bellwood, Ill.)

Enter 115 on Reader Card

Dust control

A low-cost, simplified dust control system is offered to the rock products producer whose plant normally crushes less than about 150 tph. The new system is more compact and less complex than

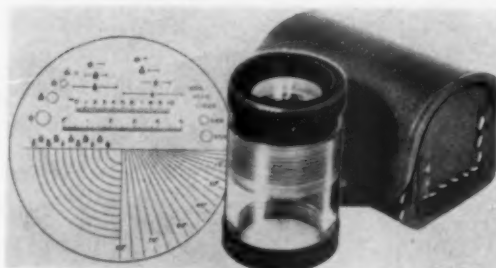
setups for larger plants, yet it can offer savings up to 33 percent over other systems, according to the manufacturer.

Dust is controlled by the Type G proportioner by adding a highly concentrated chemical solution to spray water in the ratio of one part of compound to 200 parts of water. Clean water must be available at 60 psi. pressure at crushers, belt transfer points, above hoppers or chutes and wherever dust is generated.

The new system includes a proportioning pump to deliver a fixed amount of compound from its drum, spray jets, strainers, solenoid valve and push-button control. (The Johnson-March Corp., Philadelphia, Pa.)

Enter 116 on Reader Card

Pocket comparator



A new compact comparator is offered with a sand-measuring reticle to make it easy to measure and classify the sizes of sand samples. The maker states that focusing of the 6-power magnifying glass is simple and that the instrument is easy to use. Only 2 x $2\frac{1}{4}$ -in., it can be carried anywhere for instant use. The sand-measuring reticle can be quickly replaced with a reticle for general measuring. (Edmund Scientific Co., Barrington, N.J.)

Enter 117 on Reader Card

Vibrating screens

Three new sizes of horizontal vibrating screens have been developed. These incorporate air springs and rubber-bushed phasing bars to completely eliminate the conventional leaf and coil springs.

The new sizes are 5 x 12-ft., 5 x 14-ft. and 5 x 16-ft. units. All are available with 2, $2\frac{1}{2}$ and 3 decks to provide a complete range of decks and screening area to meet a wide range of production problems. (Universal Engineering Corp., 625 C Ave. N.W., Cedar Rapids, Iowa)

Enter 118 on Reader Card

Please turn to page 170



Now—palletize cement bags automatically!

The cement industry's *first* automatic bag palletizing system was installed recently at the Riverside Cement Company, in California. Riverside can now offer its customers faster, smoother, cleaner bag packing, loading and shipping—at less cost for labor.

This automatic bag palletizing system was developed and installed by packaging equipment engineers from St. Regis®, the Lamson Corporation and Riverside. It operates at speeds up to 25 bags a minute, with five bags to a tier. Selectors permit Riverside to build from five to eight tiers per load, depending on customer requirements. Riverside's palletized shipments have increased

since installation of the new loader from 5 to 40%!

This success with automatic palletizing at Riverside, together with similar installations in other parts of the country, marks a major step forward in the industry. However, conversion to such an operation requires careful planning and a wealth of materials-handling knowledge. Our Bag Division Packaging Engineers have this experience and will work with your engineers and production staff to design your automatic palletizing system.

This is St. Regis *Packaging-in-Depth* in action—a complete bag service available from 13 manufacturing plants and 33 sales offices across the country.

Packaging-in-depth by St. Regis 

BAG DIVISION

PAPER COMPANY

NEW MACHINERY

continued from page 168



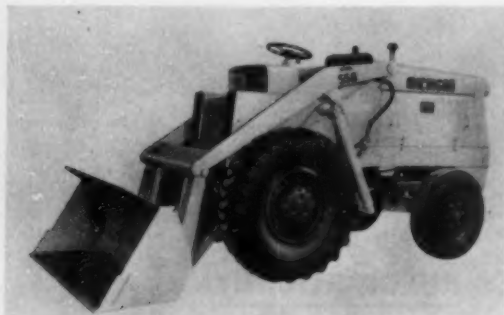
Air-cooled motor

A new line of tube-cooled motors with air-to-air heat exchange is offered to operate efficiently under unfavorable conditions. The motor-cooling design protects it from excessive moisture and oil vapor as well as air-borne sand, lime or cement dust.

These motors are available up to 2,000 hp., built in standard enclosed construction. They are suitable for use on pumps, compressors, fans, mills, crushers and other heavy equipment in the rock products industry. (The Louis Allis Co., 427 E. Stewart St., Milwaukee 1, Wis.)

Enter 119 on Reader Card

Tractor shovel



A newly designed tractor shovel offers a particularly short turning radius. The Model 55-B is about 15 ft. 8 in. long and has a turning radius of 11 ft. 2 in. when equipped with a 1-cu. yd. bucket.

The new machine can travel up to 26 mph. either forward or reverse and is powered with a 66½-hp. gasoline engine. The unit weighs about 10,200 lb., has a lift capacity of 5,400 lb. and a maximum dumping height of 8 ft. (Clark Equipment Co., Construction Machinery Div., Benton Harbor, Michigan.)

Enter 120 on Reader Card

Pack-set tester

A new laboratory machine has been developed to measure the degree to which portland cement and other fine bulk materials will pack set. This test is particularly important to producers of finely ground materials that tend to increase in density when handled in packages or stored in bulk.

The Roto-Tester has a fixture to receive a laboratory flask in which material has been packed on a standard vibrating table. The mechanism stops rotating at each half turn to produce the inertia forces that eventually break the compacted layer. The number of half turns recorded on the instrument becomes the "pack-set index."

This new device replaces manual techniques for determining pack setting. The manufacturer states that the mechanical action yields greater reliability and reproducibility than could be achieved before. (Dewey & Almy Chemical Div., W. R. Grace & Co., Cambridge 40, Mass.)

Enter 121 on Reader Card

Heavy-duty lube

A high-fiber-strength lubricant is available for heavy-duty applications in the rock products industry. Primarily designed for track roller bearings on crawler-mounted machinery, Almasol 450 is useful wherever there are problems of temperature, pressure and contamination. The fibrous consistency of the new lube is said to provide a tough film to seal out dust and moisture from bearings.

Three weights of lubricant are available—light, medium and heavy. Each is offered in 40 or 50-lb. pails, 120 to 220-lb. drums. (Lubrication Engineers, Inc., 2809 Race St., Ft. Worth, Texas)

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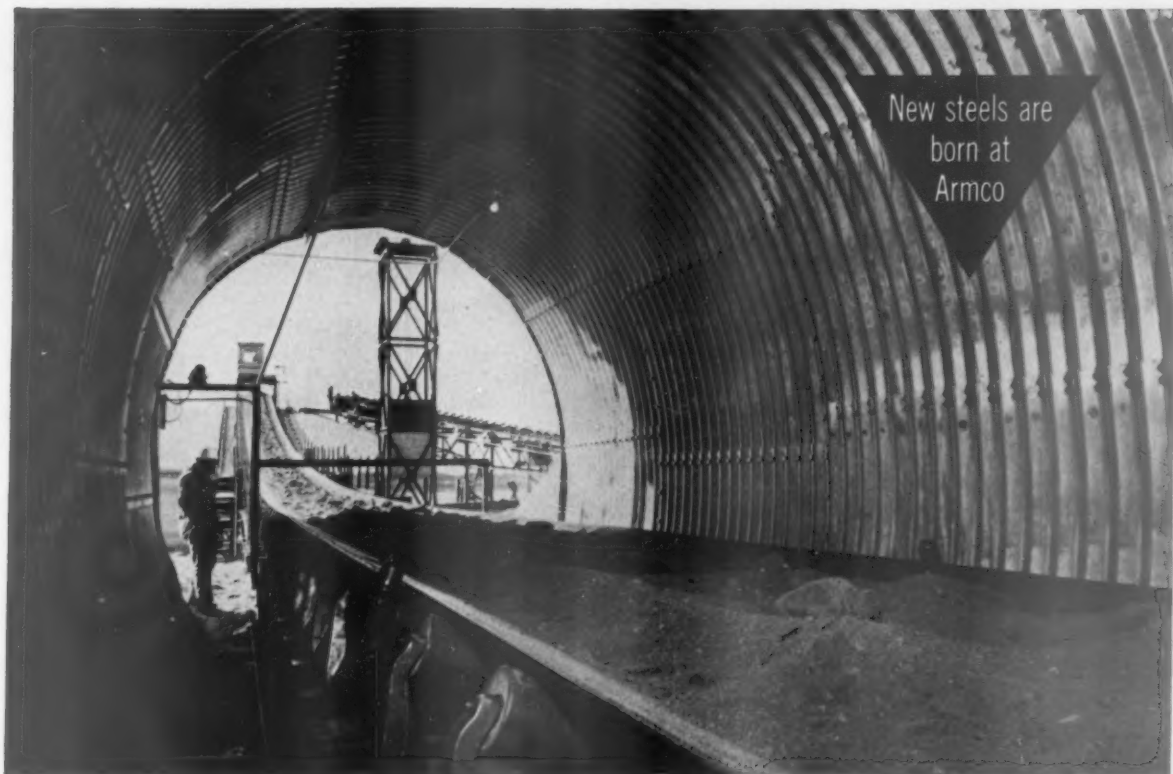
Loader transmission

A heavy-duty torque converter transmission is offered to the manufacturers of tractor loaders. The CRT-3531 is a heavier version of a transmission already used by nine out of ten of the nation's makers of front end loaders, according to the manufacturer.

The new unit is designed to handle 350 lb.-ft. of engine torque while permitting increased hydraulic capacity for bucket operation. A new three-element torque converter will provide high torque multiplication and high efficiency. Weight of the new unit will be about 1,200 lb. (Allison Div., GMC., Indianapolis, Ind.)

Enter 123 on Reader Card

END



Armco Pipe Encloses Conveyor System Under 80-Foot Storage Pile

This Armco MULTI-PLATE® reclaiming tunnel, located beneath an 80-foot aggregate pile on a large earth-moving job in Utah, demonstrates the extra strength you get with Armco Pipe. Its high strength has been proved in thousands of installations under loads ranging as high as 125 feet.

Armco MULTI-PLATE is ideal for conveyor tunnels in permanent plants or on large construction jobs. It can be installed quickly and easily. Find out more about Armco MULTI-PLATE Pipe and other Armco Corrugated Metal Structures. Write us for complete data. Armco Drainage & Metal Products, Inc., 5240 Curtis Street, Middletown, Ohio.

Workers install one of the hatches for the conveyor tunnel shown above. The opening was reinforced with steel I-beams.



ARMCO DRAINAGE & METAL PRODUCTS



Subsidiary of ARMCO STEEL CORPORATION

OTHER SUBSIDIARIES AND DIVISIONS: Armco Division • Sheffield Division • The National Supply Company • The Armco International Corporation • Union Wire Rope Corporation

Enter 1052 on Reader Card

MANUFACTURERS NEWS

Lease appointed director

W. D. LEASE, executive vice president and director of Athey Products Corp., Chicago, has been appointed a director of the Construction Industry Manufacturers' Association. Mr. Lease joined Athey in 1946 as plant engineer, became a district representative in 1950 and a year later was appointed manager of research and development. In 1954 he was appointed sales promotion manager, then vice president in charge of sales during the same year.

Ohio acquires Wellman

WALTER J. MICHAEL, president of The Ohio Locomotive Crane Co., Bucyrus, Ohio, announced that the company has acquired the entire locomotive crane business of The Wellman Engr. Co., Cleveland, Ohio. The transaction was effective in June and involves both the Wellman diesel electric locomotive crane, introduced in 1956, and the former Browning mechanical locomotive crane which Wellman had manufactured since 1954.

"We will retain the Wellman name for the diesel electric model," Mr. Michael stated. Ray Mack, a Wellman vice president, will go to Bucyrus to aid the transfer and Ohio is set up to furnish parts and service to Wellman and Browning owners. Ohio said that its new distribution and sales plans, still under study, would be announced at a later date.

Shakespeare appointed president

WILLIAM V. SHAKESPEARE has been appointed president of Cincinnati Rubber Mfg. Co., succeeding L. P. Darnell who retired after four years as president. Mr. Shakespeare joined the Thor organization in 1936, moved to the Cincinnati Rubber Mfg. Co., division of Thor in 1956 as assistant to the president and was named vice president of the division early in 1959.



Link-Belt opens bearing plant in Indianapolis

THE LINK-BELT CO., has opened a new bearing plant in Indianapolis, Ind., where as many as 758 individual gauging operations are required to produce spherical roller bearing. (see photo) and where tolerances as close as 28 millionths of an inch are maintained. Two years in the design stage, the new plant has 50 percent greater capacity than the older plant which it replaces. The 454,000 sq. ft. plant has

a straightline production flow pattern involving a wide range of materials handling equipment that is combined with high precision manufacturing, automated handling facilities, and electronically controlled machine tools gauging instruments and processes. Products made include self-aligning ball bearings, the new spherical roller bearing and other self-aligning ball and roller bearing units.

Austin Powder appoints Eddins

AUSTIN POWDER CO., Cleveland, Ohio, announces the appointment of James T. Eddins as sales representative in the Georgia-Eastern Tennessee, North and South Carolina territory. Mr. Eddins, who has served Austin in the Chicago district since 1953, will make his headquarters in Knoxville. He will handle sales of Austin explosives, permissibles, detonating fuses, blasting supplies, mine tools, drill heads and cutter bits.

Hopper trailers marketed nationally

GAR WOOD INDUSTRIES, INC., Wayne, Mich., has announced that their full line of open and closed hopper trailers, manufactured on the West Coast for the past eight years, will now be marketed nationally through the Gar Wood-St. Paul distributor organization. The open hoppers are used for maximum legal payloads in plant-to-plant hauling of aggregate, sand and gravel and contracting work.

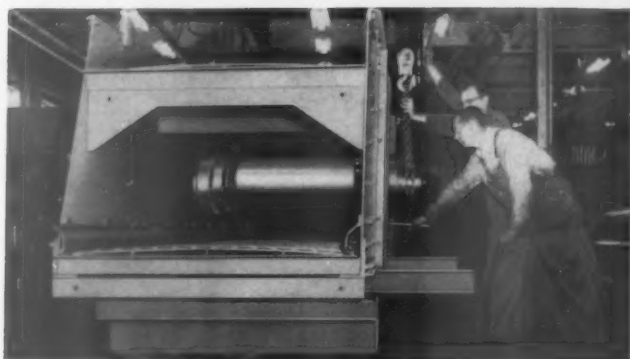
(Continued on page 174)

This is the place . . .



Yes, right here in the SECO plant, from drawing board to shipping dock, starts the dependability and screening efficiency that pays off when meeting rigid specifications.

that makes the screens . . .



That's because vibrating screens are our business . . . our only business . . . and customer satisfaction is what keeps us in business. SECO uses every means possible to assure this satisfaction in more than 500 vibrating screen models. All phases from design to fabrication and final assembly, are fully controlled here by modern machinery and experienced men . . . the extra margin of safety for your peak operating schedule is a constant consideration at SECO.

that insure your profits . . .



And here's where SECO'S superiority really pays off for you . . . on the job . . . up to 24 hours a day . . . year after year . . . meeting the most rigid specifications with precise sizing accuracy. It will pay you to take advantage of SECO's quarter century of vibrating screen experience.

Send for TWIN BEARING booklet TB-21
and 4-BEARING catalog No. 204

SCREEN EQUIPMENT CO., INC.

Buffalo 25, New York

SECO



**"TIME CONSCIOUS"
VIBRATING SCREENS**

Enter 1092 on Reader Card

(Continued from page 172)

Peerless Pump names product manager

THE APPOINTMENT OF Walter J. Blair as vertical pump product sales manager, Peerless Pump, Hydrodynamics Div., Food Machinery and Chemical Corp., Los Angeles, Calif., has been announced. Mr. Blair will be in charge of planning and supervising the sales activities for the complete line of vertical pumps.

A-C and Bell & Howell co-owners of company

AGREEMENT ON JOINT ownership of an electronic systems engineering firm located in California by Allis-Chalmers Mfg. Co. and Bell & Howell has been announced. The presidents of the two companies said that Allis-Chalmers would acquire 50 percent of the common stock of Consolidated Systems Corp., Monrovia, Calif., a wholly owned subsidiary of Bell & Howell's Consolidated Electrodynamics Corp. Consolidated's operations include administrative, engineering and manufacturing facilities.

"In recent years application of electronic instrumentation to industrial processes, including power generation, has increased tremendously," said the president of Allis-Chalmers. "Many of our customers are now looking for us to provide them not only with industrial equipment, but also with the systems control necessary to automate their progress."

Koehring equipment show



KOEHRING Co., Milwaukee, Wisc., has announced plans for a 4-day construction equipment show to be held in September at the company's proving grounds near Waukesha, Wisc. All of the company's construction equipment divisions, subsidiaries and branches will have exhibits at the show which will be held in two flights, September 19-20 and 22-23. Other participating units will include: Buffalo-Springfield Co., Flaherty Mfg., C. S. Johnson Co., Koehring-California Co., Koehring Export Div., Koehring-Waterous Ltd., Kwik-Mix Co. and KA-MO Tools, and Parsons Co. and Shawnee Mfg. Co. The exhibits will feature equipment for a wide variety of construction activities.

Hardinge names men in west, central areas

CHARLES C. NOLAN has been named western district manager for Hardinge Co., Inc. The former assistant manager will be headquartered at the San Francisco office.

Jack D. Power was chosen to manage the central district for Hardinge. He will be located in Chicago, with territory including Indiana, Illinois, Iowa, Missouri, Arkansas, Nebraska, Kansas and Oklahoma.

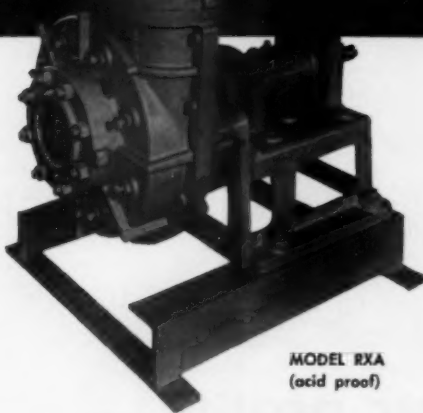
Koehring wins mining award

KOEHRING Div., Koehring Co., Milwaukee, Wisc., has received a blue ribbon mining award from Mining World and World Mining magazines for "achievement in equipment develop-

(Continued on page 176)

NEW!

**PERFORMANCE-PROVED
CERAMIC-LINED
SAND PUMP**



MODEL RXA
(acid proof)



ARE YOU USING pumps for transferring fines? Is the volume in the range of 110' head-150 GPM to 70' head-600 GPM?

ARE YOU TIRED of replacing impellers, liners, shells, sleeves, seals, bearings, shafts, bolts, nuts, gaskets, etc., every few months?

ARE YOU WISHING someone would produce a pump worthy of your expectations? Something that would hold up for say — 14 months? 18 months? 2 years!

YOU WILL FIND the ultimate in wear resistance in ceramic lined pumps using silicon nitride bonded silicon carbide wear parts.

SOUND EXPENSIVE? Not at all. Cost is comparable to alloyed iron or rubber lined pumps.

For additional information on the new MODEL RXA Ceramic-Lined Sand Pump, write:

The KANSAS CITY HAY PRESS COMPANY

801 Woodswether Road Kansas City 6, Missouri

Enter 1083 on Reader Card

The man who knows how to get ahead (and stay ahead) in business — gets his information and inspiration from the pages of his businesspaper. Nothing else you read is so filled with the news, the facts, the fresh ideas so vital to your success in business as the advertising and editorial pages . . . in your businesspaper.



PHOTO ON LOCATION BY EHRENBER

Where there's business action, there's a businesspaper . . . where there's a *ROCK PRODUCTS*

INDUSTRY . . . there's

ROCK
PRODUCTS



One of a series of advertisements prepared by the ASSOCIATED BUSINESS PUBLICATIONS

ROCK PRODUCTS, August, 1960

175

MANUFACTURERS NEWS

(Continued from page 174)

ment aiding the technological advancement of the mining industry." The division received the award for the company's Model 205 "Skooper," an excavator-loader. In addition to working in open pit and underground mines, it is used by pit and quarry operators, contractors, and highway departments for a wide range of digging and loading jobs. It features a hydraulic crowd and roll-back bucket. Because it has an excavator turntable, it can fill its

2-cu. yd. bucket, swing around and dump its load while standing in one spot. Engine power is concentrated on digging effort, not traveling.

Timken's Updegraff becomes general factory manager

RALPH W. UPDEGRAFF is new general factory manager, Bearing and Rock Bit Divisions, of The Timken Roller Bearing Co. Since coming with the company in 1948, Mr. Updegraff advanced from industrial engineer to a factory chief industrial engineer, and

then to general superintendent of the Canton and Gambrinus bearing factories, his most recent position.

Timken also announced that Robert L. Sisson has replaced Mr. Updegraff in the latter position. Starting as screw machine operator in 1937, Mr. Sisson advanced through several levels of foreman. Most recently, he has been superintendent of the Gambrinus bearing factory.

Research-Cottrell elects pres.



JAMES P. KNEUBUHL has been elected president of Research-Cottrell, Inc., Bound Brook, N.J., by the board of directors. Mr. Kneubuhl succeeds Mr. William Hinkley who will continue as chairman of the board and as president of the parent organization, Research Corp., a foundation. Research-Cottrell is the manufacturer of electrical precipitators and other industrial gas cleaning equipment. Mr. Kneubuhl comes to the company from the Fluor Corp., Ltd., Los Angeles, Calif., where he was vice president in charge of utility and government sales.

Personnel changes at Modern Engineering Co.

MODERN ENGINEERING CO., announces the appointment of Roy Brigrance and Vint Gubbins as factory sales representatives for its MECO Oxy-Acetylene Welding and Cutting Apparatus and Industrial Regulator Divisions.

Mr. Brigrance will work with distributors in Ohio and adjacent areas and headquarters in Cleveland. Mr. Gubbins will have the Illinois territory which includes parts of adjacent states and headquarters near Chicago.

END



KOLMAN
VIBRATING SCREENS

(Left)
Two Type DC
12'x60"
double-deck
Kolman screens
making crushed
granite
separations

KOLMAN Low-Cost Design Delivers More Screening Efficiency

Kolman packs terrific screening capacity into a minimum of space. Both portable and stationary installations are simplified by Kolman's compact design. Larger screens can be placed in limited areas. And this simple, effective design keeps prices reasonable and cost of operation normal.

BIGGER PRODUCTION

The location of the vibrator mechanism varies according to the length of the screen, assuring that full vigorous vibrations are delivered uniformly to the complete screen load. It effectively reduces "blinding" and clogging. The even radial load on the bearing results in longer life, trouble-free operation.

'FLOATING ACTION'

Kolman's unique spring suspension system gives the freedom of movement required for added capacity without transmitting vibrations to the frame or supporting equipment. Its smooth, efficient operation makes the screen seem to "float" while in action.

RUGGED CONSTRUCTION

Hundreds of applications have proved the ability of Kolman Vibrating Screens to take all the abuse dished out by the toughest jobs. The Kolman design permits handling surge loads more effectively than positive eccentric type screens.

Before you make any screen installation in construction, mining, industrial or aggregate production, check to see how much more Kolman's "Floating Action" Vibrating Screens offer you now, and for years to come. Single, double, and triple-deck models in sizes from 4'x24" to 14'x60".

(Left)
Type TC
12'x48"
triple-deck
screen



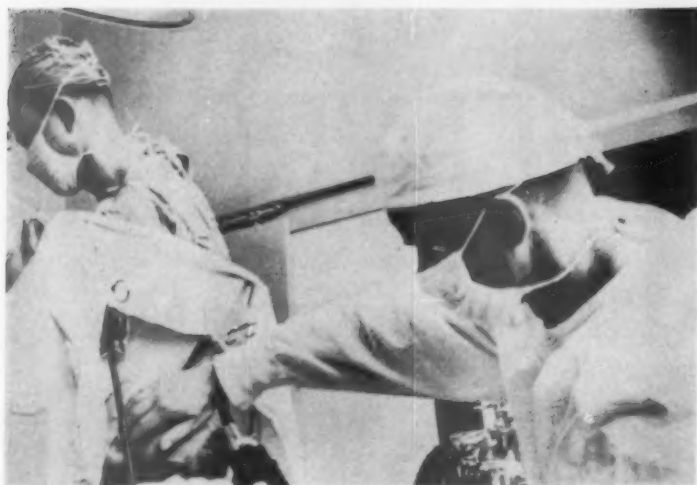
SEE YOUR DEALER OR WRITE FOR LITERATURE TODAY

KOLMAN MANUFACTURING COMPANY

4200 West Twelfth Street

Sioux Falls, South Dakota

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SPEAKING of OPERATIONS

THE TOOLS FOR YOURS ARE IN THE **BOOK**



Ready Mixed Concrete

By

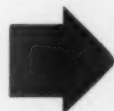
James A. Nicholson



Now get the *inside story* on the fastest-growing industry in the world. **READY MIXED CONCRETE** contains 10 sections and 40 chapters of know-how for organizing a new business or improving an established one. James A. Nicholson, recognized authority in the field, covers every facet of successful operation . . . from maintenance to merchandising . . . from front-office management to labor and customer relations. Send today for this powerhouse of interesting, informative reading.

ROCK PRODUCTS . 79 W. MONROE STREET . CHICAGO 3, ILL.

**SEND
TODAY!**



\$5

A COPY

\$4 a copy in units from 4 to 20
... Ask about special discounts
on orders of more than 20.

Please send _____ copies of **READY MIXED CONCRETE**. I enclose \$ _____
(check or money order).

R-860

Name

Company

Street

City

Zone State

JUST ABOUT EVERYBODY

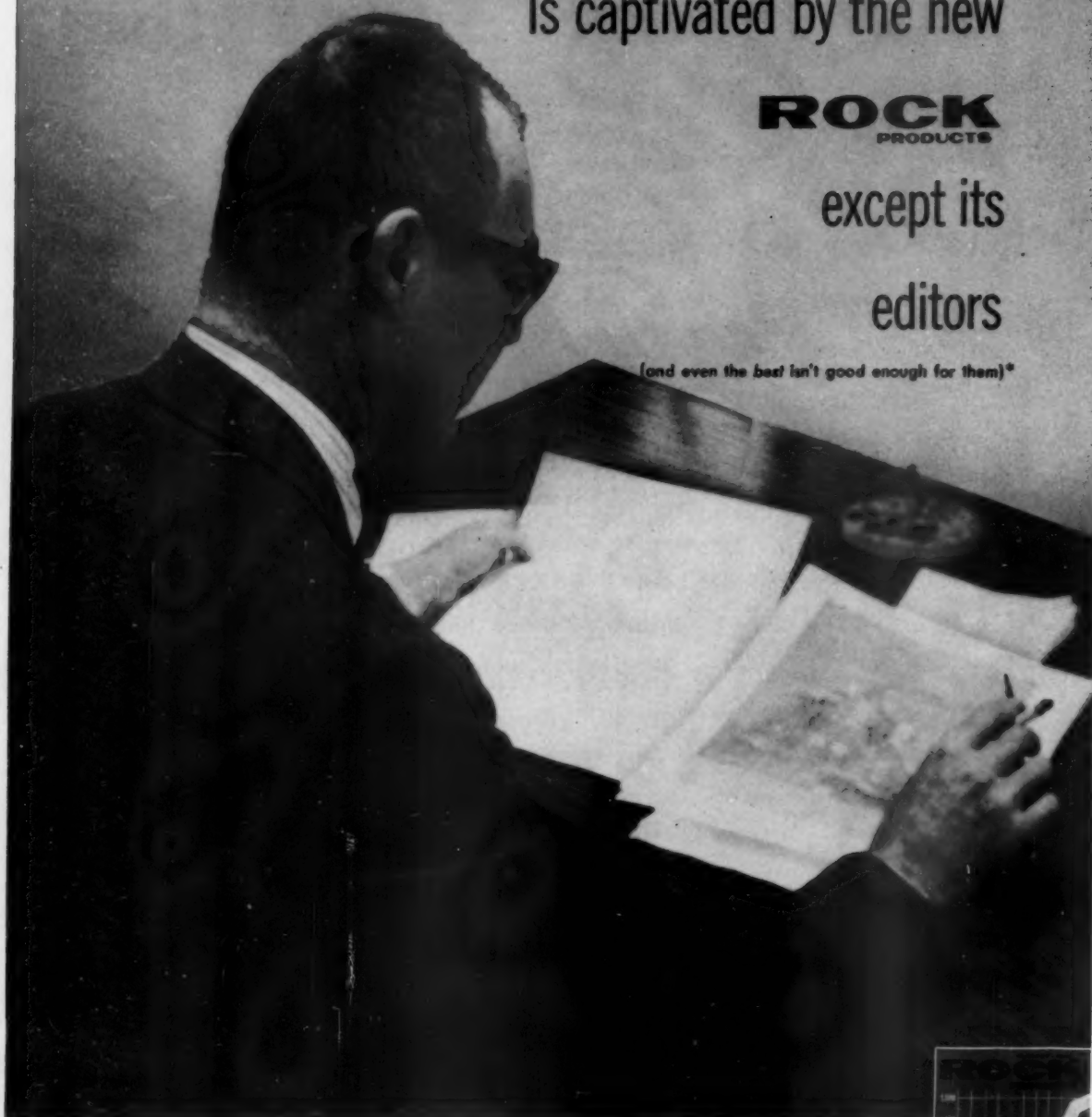
Is captivated by the new

ROCK
PRODUCTS

except its

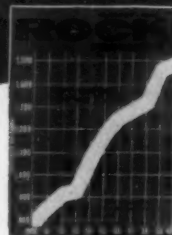
editors

(and even the best isn't good enough for them)*



*

That's why, month after month, ROCK PRODUCTS is the best-read magazine among management and operating executives in the giant Rock Products industry—17,600 of them. And why things happen when you advertise in **ROCK** PRODUCTS



WHERE TO BUY

You may find just what you're looking for in the used equipment, employment and professional advertisements below. Box numbers are confidential and advertisers' names will not be disclosed. Send replies to: Box Number (shown on ad), c/o ROCK PRODUCTS, 79 W. Monroe St., Chicago 3, Ill. All replies will be forwarded to advertisers daily.

LIQUIDATING

1—Allis Chalmers SS rotary dryer, 6' x 50', complete with drive, motor, fans and blowers.

2—Louisville SS rotary dryers, 8' x 50', complete with drives, motors, fans, blowers, etc.

1—Traylor 11' x 155' rotary kiln, 2 tires, welded $\frac{3}{8}$ " shell, complete with drive and motor

1—Louisville rotary steam tube dryer, 8' x 45'

1—Rotary dryer 7' x 60', 2 tires, $\frac{1}{2}$ " shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary 6' x 64', 2 tires, $\frac{1}{2}$ " shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 56', 2 tires, $\frac{1}{2}$ " shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 6' x 50', 2 tires, $\frac{1}{2}$ " shell, complete with drive, motor, blowers and

all auxiliary equipment

1—Rotary dryer 6' x 35', 2 tires, $\frac{1}{2}$ " shell, complete with drive, motor, blowers and all auxiliary equipment

1—Rotary dryer 4' x 20', 2 tires, $\frac{1}{2}$ " shell, complete with drive, motor, blowers and all auxiliary equipment

10—Pacific vertical feed water reciprocating pumps, 10 GPM to 340 GPM, 80' head to 175' head, complete with motors

1—Dorr Type DSFR—2 classifier, 3' x 20'6" x 2 $\frac{1}{2}$ " slope

1—Hardinge pilot size ball mill, 24" x 8", complete

1—Patterson rod mill, 4' x 11'6"

R. GELB & SONS, INC.

U.S. HIGHWAY 22, UNION, N. J., Phone MURdock 6-4900



DESIRABLE EQUIPMENT AT REALISTIC PRICES

Crushers and Hammer Mills
Muller Type Mixers-Mills
Rotary Dryers and Kilns
Sifters, Screens, Separators
Filter Presses and Filters
Ball and Pebble Mills
Raymond Imp Mills, All Sizes
Presses and Pellet Machines

Send for "First Facts"

FIRST MACHINERY CORP.

209-10th St., Brooklyn 15, N. Y.
ST 8-4672 Cable "Effemcy"

SALE OR RENT

Two 44-Ton Whitcomb Diesel Electric Locomotives

One 25-Ton GE Diesel Electric Locomotive
BIRMINGHAM RAIL & LOCOMOTIVE COMPANY
P. O. Box 391 Birmingham, Alabama

TRAILER CLEARANCE

LaCrosse 22 Ton Low Boy, 8:25 x 15 tires, flat deck, air.

Rogers 20 Ton Low Boy, 9:00 x 15 tires, 6" drop deck, air.

LaCrosse 16 Ton Low Boy, 8:25 x 20 tires, flat deck.

All Located in Our Yard

EIGHMY EQUIPMENT COMPANY
Pierpont at W. State St. WO 4-6706
ROCKFORD, ILLINOIS

RAILS AND CARS

ALL ACCESSORIES,
ALL CLASSES OF USED MACHINERY

M. K. FRANK
Grand Central Palace, New York, N.Y.
401 Park Bldg., Pittsburgh, Pa.

CLOSING OUT!

CRUSHING & GRINDING PLANT MANCHESTER, CONN.

Symons 3' shorthread cone crusher
Buchanan 13" x 24" JAW, 50 HP
Hardinge 7' x 36" conical pebble mills, silix stone lined

Allis-Chalmers 6' x 18' pebble mill, buhrstone lined.

Abbe Ang. #18 6' x 8' pebble mills, buhrstone lined, 30 HP

Christie 4'6" x 45' rot. dryer.

Steel bucket elev.; to 40' high

SEND FOR CIRCULAR #360A

KILNS-DRYERS

1—11' x 10' x 175' Vulcan Kiln

3—10' x 78' National Iron Dryers, $\frac{3}{4}$ " shell, center tube

2—8'8" x 70' Hardinge #XA18 dryers, $\frac{5}{8}$ " Welded Shell

1—8' x 114' United Kiln, $\frac{5}{8}$ "

2—8' x 60' Davenport dryers.

3—8' x 40' Stearns-Roger dryers, $\frac{5}{8}$ "

1—7'6" x 62' dryer or kiln, $\frac{1}{2}$ "

1—7' x 50' Allis-Chalmers dryer

1—6' x 7' x 100' Kiln, $\frac{1}{2}$ " shell

1—3' x 23' Standard dryer, $\frac{1}{4}$ "

BALL, ROD & PEBBLE MILLS

1—Kennedy 7' x 9' ball, 150 HP

1—Hardinge 10' x 48" conical ball

1—Hardinge 7' x 36" conical peb.

3—Hardinge 6' x 48" conical ball.

1—Hardinge 4'6" x 16" conical ball

1—Allis 6' x 18' pebble-tube

3—Allis 5' x 22' ball-tube, 150 HP

1—Allis 6' x 16' ball-tube

1—Allis 5' x 5' ball, 75 HP

CRUSHERS-PULVERIZERS

1—Symons 3' shorthread cone crusher

1—Farrel 36" x 15" jaw

1—Farrel 20" x 6" jaw

1—Buchanan 13" x 24" jaw

1—Mitchell 18" x 9" jaw

1—DIXIE #5060 hammermill, 500 HP

1—B. & W. #E32 pulv., 75 HP

1—Robinson 36" saw tooth crusher

PERRY EQUIPMENT CORPORATION

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POplar 3-3505

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LIQUIDATION

ALPHA PORTLAND CEMENT CO.
MANHEIM, W. VA.

- 6—Vulcan 6'6"x60"x1/2" Rotary Kilns
- 1—Mossor 4'x47"x1/2" Rotary Dryer
- 1—Traylor 8'x11' Steel Lined Ball Mill
- 2—Beth. Fdy. 7'x24' Combel Mills
- 2—Allis-Chalmers 6K; 8K Gyrotorys
- 1—Barber Greene Model 82A Loader

STOCK ITEMS

- 8'x60"x1/2" welded Rotary Kiln
- 6'x120"x1/2" Vulcan Rotary Kiln
- 3'x3'x12" Horiz; 4'x9'x12" Vert. Puggers
- Komarek-Graevs 27"x24" Briquet Presses
- 6'x25'; 6'x50' Louisville Rotary Dryers
- 7'x50'; 8'x70' Ruggles-Coles Dryers
- Dixie #5060 Mogul Hammermill
- 15'x8" to 24'x18" Jeffrey Hammermills
- 2—Raymond 5 Roll Low Side Mills
- Raymond 3 Roll #3036 Hi-Side Mill
- Raymond #50, #40 Impact Mills
- Jaw Crushers 48"x60", 36"x48", 20"x6"
- 6—Tyler Hammer Screens 4'x8', 4'x6"
- 4—Robinson Saw Tooth Crushers
- 535"—24" Troughing Belt Conveyor
- Bucket Elevators 45' to 90' Centers

BOILERS, COMPRESSORS, GENERATORS

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PORTABLE ROCK CRUSHING PLANT

Near St. Louis

LIMA 604-BACKHOE ATTACHMENT FOR SALE

Primary Plant 3x10 apron feeder; 36x40 Dixie Hammermill; UD-34 International Diesel Engine; 34" conveyor, 34' long for discharge to secondary machine.

Secondary Machine equipped with a 62x30 Grounder Hammermill; 4x16 double deck Soco screen; D-1300 Caterpillar Diesel Engine; and conveyor 20' wide x 23' long; return conveyor 20' wide x 16' long. This is a closed circuit machine.

These 3 Units are all mounted on exceptionally good rubber and can be transported very easily. This plant is ready to pull into your pit and start crushing.

For Quick Sale, We Are Willing To Sacrifice Both Plants For \$32,000.00.

Backhoe Attachment for Lima 604 Crane, Perfect Condition, Never Used\$4,000.00

LAKE COUNTY
EQUIPMENT CORP.

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HIGHLAND PARK, ILLINOIS
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YOU CAN SAVE MONEY AND MAKE A PROFIT WITH THIS EQUIPMENT

QUARRY EQUIPMENT

Cedarapids 2234 Primary Jaw Crushing plant.
Cedarapids Jr. tandem crushing plant, 1038 jaw.
Cedarapids Portable Screening Unit.
Cedarapids 1036 Jaw Crusher. Rebuilt.
Cedarapids 1216 Twin Jaw Crusher. Reconditioned.
Cedarapids 3033 Hammermill. Remanufactured.
Cedarapids 2033 Hammermill. Rebuilt.
Cedarapids 16' open inclined bucket elevator.
Cedarapids 4' x 14' 3-deck screen.
Cedarapids 4'x12', 2-deck screen.
Telsmith 3' x 9', 3-deck inclined screen.
Aggregates 4' x 14', 3-deck inclined screen.
34" dia. x 23' lg. revolving screen.
Cedarapids 30-S, 3-compartment charging hopper. New.
Smithco 10-Yd. Portable Charging Bin.
8' x 12', 8' x 18', 13' x 23' bins in stock
18", 24", 30", 36" conveyors & belting
Smithco 30"x24" 7 1/2 H.P. Belt Conveyor.
Barber Greene Model 848 Asphalt Plant.

SHOVELS AND CRANES

Lorain L-503, 1-yd. Diesel Crane Hoe
Lorain L-30, 3/4-yd. diesel dragline. Excellent.
Unit 1020 3/4-yd. diesel powered shovel.
Isley E-12, 1/2-yd. gas backhoe
Bucyrus-Erie 103, 3/4-yd. Gas Shovel.
Byers 83-cc, 20-ton truck Crane
Lorain MC-425, 25-ton Moto-Crane
Lorain MC-414, 20-ton Moto-Crane.
Link Belt HC-60, 25-ton truck crane.
Michigan TLDT-30, 10-ton truck crane.
Lorain MC-254, 15-ton Moto-crane.
Lorain TL-30, 10-ton Moto-crane.

TRUCKS, TRACTORS, SCRAPERS

2—Euclid 12-yd. bottom dumps. Good.
2—Euclid 27PD, 15-ton rear dumps
1—Euclid 2FD, 15-ton rear dump.
1—Euclid tractor with 2200 gallon water tank.
1—Caterpillar D-8 with push block
1—Caterpillar D-7 with cable bulldozer.
1—Caterpillar D-7 with Hydraulic Angledoser
1—Caterpillar D-6 with Hydraulic Angledoser
1—Caterpillar D-6 with cable angle doser.
1—Caterpillar HT-4, 1 1/2-yd. Traxcavator.
1—Caterpillar D-4 tractor only.
1—Euclid TC-15, 18 engine tractor
1—International TD-34 with cable angledoser.
1—Letourneau Super C Tournadoser. Excellent.
1—Allis-Chalmers HD-9-O Tractor with loader.
1—International 577S, 18-yd. scrapers.
2—Allis Chalmers TS-300, 15-yd. scrapers.
2—Euclid TS-24, 34-yd. twin engine scrapers
1—Euclid 18 1/2-yd. six wheel scraper.
3—Euclid 7-yd. overhung engine scrapers

Inquire for list of drilling equipment, air compressors, diesel power units, generators, shovel & backhoe attachments.

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HOISTS: One single drum, 8' dia., 60" face, 700 H.P. Also One double drum, 10' dia., 10' face, 1250 H.P., 1200 FPM, 1 1/2" rope. Both above with 2200 volt, 3 phase, 60 cycle motors and controls.

VIBRATOR FEEDERS (NEW): Two Jeffrey 24 x 48" with model 4DTS vibrators, with or without new spare parts and controls.

DERRICK & HOIST: 25 ton stiff leg, 75 ft. boom, 150 H.P. double drum hoist and swinger.

SCREEN: Tyler F800, single deck, heavy Scalper 8' x 10'. One F600 size 4' x 12'.

TRUCK: Koehring Dumptor model 60, new condition.

JAW CRUSHERS: One 40 x 42 Allis Chalmers with 150 H.P. V-belt drive motor and controls with or without heavy duty Apron Feeder 42" x 14' 3", with motor, reducer and drive, condition guaranteed. One Traylor 15 x 24". One Allis Chalmers 18 x 30".

DRYERS: One 5' dia. x 25 ft. and one 3' dia. x 34 ft.

KILN: Rotary 4 1/2 ft. dia. x 40 ft. with rotolone and 7 1/2 H.P. motor, 3 H.P. motor and speed reducer, classifier, kiln burner, etc.

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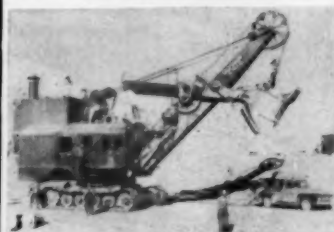
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170 B Bucyrus Erie Shovel

CONVEYORS

3-6" x 43' Carpcor, BC-68, sliding belt.
2-6" x 33' Carpcor, BC-68, sliding belt.
1-60" x 150', steel framework, 100 HP. gearmotor
1-42" x 1250', Link Belt, 2-100 HP. gearmotors
1-36" x 645' Link Belt, 100 HP. gearmotor
1-42" x 870' Link Belt Trailing Type and Conveyco mobile stacker, 100 HP. gearmotor 440 V.

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1-10 x 20 Rogers Iron Works, with drive
1-10 x 21 Telsmith wit motor & drive
1-10 x 30 Pacific, Type KH, motor & drive
1-2 1/2" x 4' Brown chipmunk, 2 HP. 220/440 V
2-2 1/2" x 3 Brown chipmunk, 3/4 HP. Motor
1-15" x 36" Universal, 50 HP. 220/440 V.

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1-10" x 36" Pioneer Model 40 V, UD 24 Diesel Power.
1-15" x 24" Cedar Rapids Portable, Case Gas Power
1-10" x 16" Cedar Rapids Pitmaster, Complete UD 14 Diesel

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Conveyco truck dump station, Hopper 15' x 15' x 10' with tilting Grizzly, 4' x 8' plate feeder, all complete with Hydraulic cylinders, gearmotor drives.

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1-48" x 30' Hardinge Ruggles Cole, Complete Excellent. Located Clearwater, South Carolina

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1-3' x 8' Hendy Rod Mill, 30 HP. 440 V.
1-5' x 10' Marcy Ball Mill, 100 HP. 440 V.
5-8' x 9' Traylor Ball Mills

SCREEN

1-9' dia. x 5 1/2' Yuba Trommel, 100 HP. West. 440 V.
1-4' x 12' Tyler Ty-Rock, F-600, 10 HP. 220/440 V.
1-4' x 8' Symons Rod Deck Screen, 7 1/2 HP. 220/440 V.
1-4' x 10' Tyler Hammer, Type 38
2-6' x 12' Allis Chalmers lowhead, 10 HP. 220/440 V.

SHOVELS

1-Model 111 M Marion shovel & Dragline, Diesel Electric 4 yd., 100' Dragline Boom
1-Model 170 B Bucyrus Erie Electric shovel Esco Bucket, 2400/4160 Y, Rotolone Air Filter system, Complete with rubber cable, and Junction Box.
1-Model 7200 Marion walking dragline, diesel-electric
1-54 B Bucyrus Erie Dragline, 100' Boom 2 yd. Bucket.

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4-12"-6" x 4' Conveyco Sand Wheels, Complete with Tank, w/20 HP. West. gearmotors, Exc.

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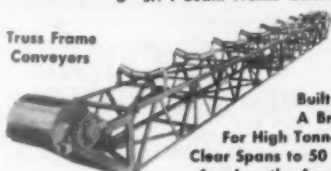
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BONDED TROUGHING IDLER CONVEYOR BARGAINS



8" Jr. I Beam Frame Conveyors



Truss Frame Conveyors

Built Like A Bridge
For High Tonnages
Clear Spans to 50 Ft.—
Any Length—Any Belt
Width

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 1/4" or 2 1/2" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/4" top rubber cover x 1/4" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. WRITE FOR BULLETIN #1136.

Bonded troughing idler conveyors also available in Truss Frame Construction. WRITE FOR BULLETIN #1189 AND PRICES.

JR. I BEAM CONVEYOR PRICES

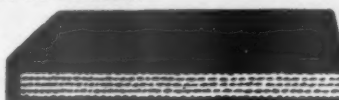
Conveyor Prices Include Belting

Belt Width	Conveyor Length	List Price	Sale Price	Add or Deduct Per Foot
14"	25'	\$1422	\$ 766	
14"	50'	2266	1181	\$16.62
14"	85'	3445	1763	
16"	20'	1287	700	
16"	45'	2150	1128	
16"	60'	2715	1354	17.10
16"	90'	3786	1897	
16"	150'	5928	2923	
18"	25'	1507	830	
18"	45'	2261	1190	
18"	70'	3205	1641	
18"	85'	3771	1912	18.03
18"	100'	4337	2182	
18"	150'	5469	2723	
18"	200'	8111	3985	
20"	25'	1547	871	
20"	60'	2940	1546	
20"	75'	3536	1836	19.30
20"	90'	4133	2125	
24"	25'	1622	922	
24"	45'	2479	1335	
24"	70'	3550	1852	
24"	100'	4835	2473	20.68
24"	120'	5692	2886	
24"	150'	6977	3507	
24"	200'	9119	4540	
30"	50'	2969	1591	
30"	70'	3948	2054	
30"	90'	4928	2518	23.17
30"	140'	7376	3676	
36"	25'	1854	1105	
36"	45'	2915	1623	
36"	60'	3711	2012	25.91
36"	100'	5832	3048	

Other lengths and belt widths priced upon application. BONDED 30" DEEP TRUSS CONVEYORS also built in heavy duty Portable Models. Available with Screen and Feeder and with mast or mastless type undercarriage and hydraulic powered mechanism. Lengths to 60 feet and belt widths through 30 inches. Equipped with Tow Hitch for easy moving from one job-site to another. PRICED FROM \$2365.

TESTED CONVEYOR BELTING*

WE PAY FREIGHT ON 200 POUNDS OR OVER PLUS AN ADDITIONAL 10% SAVINGS FROM SALE PRICE FOR FULL ROLLS 500 TO 450 FEET.



MAJOR BRAND: 12# to 15# Friction Pull. 800# to 1000# Cover Tensile. Heavy Duty. 28 oz. duck, 1/4" top x 1/4" bottom rubber covers. Tough cotton duck, strong carcass and proper flexibility. Used in moving boxes, bags, coal, sand, gravel, crushed stone, salt, earth and similar materials.

Width	Ply	Domestic Belt Per Foot
14"	4	\$2.94
16"	4	3.09
18"	4	3.42
20"	4	3.95
24"	4	4.43
30"	4	5.42
36"	4	6.43

MAJOR C-BEE BRAND: Smooth Surface. 16# to 17# Friction Pull. 1600# to 2800# Cover Tensile. 28 oz. duck 4 Ply, Skim coat between plies. Heavy Duty belt for severe service and abrasion resistance.

Width	Top Cover	Bottom Cover	Imported Belt Per Foot
14"	1/4"	3/8"	\$2.96
16"	1/4"	3/8"	3.12
18"	1/4"	3/8"	3.44
20"	1/4"	3/8"	3.97
24"	1/4"	3/8"	4.46
30"	1/4"	3/8"	5.56
36"	1/4"	3/8"	6.45

THE FOLLOWING BELTS ARE 5 PLY, 32 OZ. DUCK:

Width	Top Cover	Bottom Cover	Imported Belt Per Foot
24"	1/4"	3/8"	\$5.33
30"	1/4"	3/8"	6.59
36"	1/4"	3/8"	8.45

MAJOR BEE BRAND: 16# to 19# Friction Pull. 2400# to 3000# Cover Tensile. Skim Coat Between Piles. A high grade of heavy duty, 28 oz. duck with 1/4" top x 1/4" bottom rubber covers. For severe service and abrasion resistance. For stone, mineral ores, concrete, cement and coal.

Width	Ply	Domestic Belt Per Foot	Imported Belt Per Foot
16"	4	3.40	3.14
18"	4	3.98	3.47
20"	4	4.54	3.99
24"	4	5.14	4.50
30"	4	6.31	5.58
24"	5	6.01	5.25

MAJOR B-X SMOOTH SURFACE: 20# to 24# Friction Pull. 3400# to 4000# Cover Tensile. A heavier duty belt with 1/4" top x 1/4" bottom covers. For higher abrasion resistance and handling of materials where more strength is required.

Width	Ply	Domestic Belt Per Foot	Imported Belt Per Foot
16"	4	\$3.93	\$3.31
20"	4	4.98	4.02
30"	4	6.92	5.80

* All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, plies, duck weights and cover thickness available at low prices.

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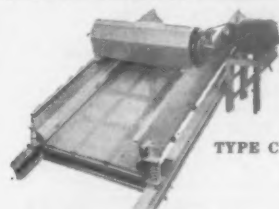
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50# Steel Test Weights with steel T Handle, \$11.00 each.

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PROMPT SHIPMENT OF ALL MODELS

SPECIAL SERVICE SCREENS



TYPE C

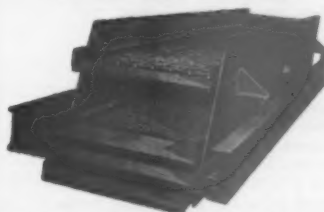
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For scalping middle-range pieces and accurate sizing of fines where quantity and feed do not warrant a larger capacity, heavy duty model. Medium to heavy construction. Can also be suspended from four steel cables and springs for portable or temporary installation. Vibration remains in working screen body. No shaking of tipple, building or platform.

Priced from\$487

WRITE FOR "SEVEN SECRETS OF SUCCESSFUL SCREENING" IN BULL. 1006

HEAVY DUTY SCREENS



FACTORY BALANCED, CONTROLLED VIBRATION. Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14'. 1 to 5 decks. "9 REASONS WHY BONDED IS YOUR BEST BUY."

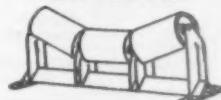
For high tonnages, heavy scalping and multiple sizing of such minerals and industrial products as handled by above models. No dead spots. Springless live-rubber mounting of screen body controls vibration. Screen cloth and plate in all models reversible for longer life. Their finished edges prevent plates from splitting and cloth from ravelling.

Priced from\$1620

BONDED IDLERS & RETURN ROLLS

FOR UTMOST ECONOMY

ON THE JOB



3-roll, 5" diameter Troughing Idlers for:

14" belt	\$19.75	24" belt	\$32.75
16" belt	20.50	30" belt	23.55
18" belt	21.90	36" belt	24.90
20" belt	22.10	48" belt	27.50

1-roll, 5" diameter Return Rolls for:

14" belt	\$ 8.50	24" belt	\$11.00
16" belt	9.00	30" belt	12.50
18" belt	9.50	36" belt	13.75
20" belt	10.00	48" belt	16.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable pre-lubricated sealed ball bearings. Maintenance is negligible. WRITE FOR BULLETIN #1138.

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6x4 Colorado Iron Ball Mill
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Farrel Jaw Crusher 36x18
Farrel Lab. Jaw Crusher 6" x 2"
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New England Jaw Crusher 14" x 28"
Acme Jaw Crusher 14x26, Steel Frame.
Jeffrey Hammermill 30x24, A-2
Pennsylvania Hammermill 30x24, M-2
Sturtevant #1 & #1 1/2 Rotary Crushers
Iowa 25 Yd. Portable Crushing Plant
Head & Tail Assembly 42" Conveyor,
Roller Bearing, Almost New.
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22" Magnetic Pulleys
New Holland Plate Feeder 24" x 60"
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24" x 93" Truss Frame Conveyor,
Complete with Walkway, All New.
500' 9" Screw Conveyor Complete With
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20" Roller Bearing Trough Idlers
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New Universal Screens in Stock.

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DIESEL ELEC. LOCOMOTIVES & CRANES
4—65 ton Whitcomb 2—25 ton & 2—20 Ton
2—45 ton & 1—80 ton & 4—100 ton Gen. Elec.
25 ton Amer. Diesel Loco Crane

ROTARY DRYERS & KILNS

5' x 25', 6' x 72', 8' x 60', 9' x 160', 10' x 78',
5' x 33' Ruggles-Coles XA-8 Dbl. Shell.
36' x 30' Ruggles Coles Rotary Kiln complete

REDUCTION MILLS & FEEDERS

6' x 9' Traylor Ball Mill w/motor
6' x 5' CIW Ball Mill w/motor
5' x 10', 6' x 12' & 7' x 15' Red Mills
2—KVS 5' x 8' Ball Tube Mills Air Swept
4' 0" Traylor Type TY-Gyratory
32" x 40" Cedar Rapids Jaw Crusher w/Feeder
30" x 36", 36" x 42" & 56" x 72" Jaw Crushers
25B TelSmith Primary Breaker
2—20" Allis-Chalmers S.M.C.C. Gyratory Crs.
15" x 24" Rogers RB Jaw Crusher
15" x 24" & 20" x 36" Pioneer Jaw Crushers
2A Cedar Rapids Port. 24 x 16 Roll Crusher
14x28, 15x24 & 10x36 Cedar Rapids Jaw
48" x 72" Buchanan C Jaw Crusher
Bradley Hercules Mills (3) Type 6000
P55 Syntron Grizzly Feeder
3' x 12' Seco Single Screen
8' Gayco Centrifugal Air Separator
36" x 96" H.R. Vibrating Pan Feeder New
24" x 95" H.R. Truss Conveyor New
6—30" x 32" Ding's Magnetic Head Pulleys
3—200 HP & 160 HPSD. Ottumwa Elec. Hoists.

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2 Amer. R20-60 Gantry 139' Boom

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Buffalo type B 60 ton motor truck scales 45' x 12'
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Truck scales 30 ton, 20'x5' American Pitless
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No. 10 Norblis Type H.E.L. S-collectors
Howe scale No. 83 exact weight indicator
St. Regis Type 100 L8 valve bag filling machine.

MILLS—CRUSHERS—KILNS—DRYERS

JAW: Ballance, 14x16, Buchanan 18x30, 36x42,
Type C 30x42, Cedar Rapids 20x30, Traylor 28x30,
36x48, 56x72, Lippman 36x36, Universal 30x42;
Superior McCully 42x40.
GYRATORY: Al. Chal. 8, 3K, 10", 16", Gates 12K;
Traylor 22 Kennedy Van Saun 37 1/2"
CONE: Symons 7', 4 1/2', 5 1/2', Los-Ken 36";
Traylor 7 1/2'; TelSmith 3".
ROLL: Cedar Rapids 24x16, 30x30; Al. Chal.
37x16, 42x16, Pioneer 40x22, 40x24 triple, 48x24;
TelSmith 48x22; Universal 30x18; Lippman 40x30;
MILLS—ROD—Denver 4x8, 4x10; Hardinge 4x10;
Marcy 3x8, 8x12.

TUBE: Al. Chal. 6x22, Baidith 5 1/2"x20, 6"x21;
Hardinge 4 1/2"x10" 8x18"; 8x9"; 8x8"; 8x4"; 10x48.
HAMMERMILLS: Penn SXT-350 HP motor, 63K
10"x4" 7"; Stedman 24x30, 36x42; Cedar Rapids
50-50, 50x55, 50x55, 50x55; Ditzle 30x50.
AUTOCRAVES: JAC 6'6"x36" Quick Acting.
KILNS: 6"x50", 6"x120", 9"x100", 8"x124".
DRYERS: 6"x40, 4x60, 8x72.

CRUSHING—WASHING—CLASSIFIER

Pioneer 10"x16" Crush. Plant with Pioneer 30S-W
Washing-Screening Plant
Eagle log washers Model HMD 48"x30"; BMD 48x22
7'x21' Twin, 30"x20' Dbl. wash. 30"x20'
Pioneer Port. 10x24 jaw, 24x16 roll. Complete
C-R Prim. Port. 22x26. Diesel.
Diamond Wes-Con Port. Prim. 30x36" crusher.

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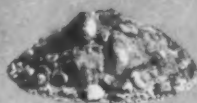
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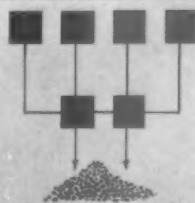


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